ASPECTS OF CANCER EDUCATION FOR PROFESSIONALS

E. L. HAAGEDOORN

ASPECTS OF CANCER EDUCATION FOR PROFESSIONALS

Stellingen, behorende bij de dissertatie 'Aspects of cancer education for professionals' van E. L. Haagedoorn.

1 - Voor effectief onderwijs in de oncologie kan een 'oncologieblok' slechts een onderdeel zijn van een gecoördineerd en geïntegreerd multidisciplinair oncologieonderwijsprogramma, dat verdeeld is over alle jaren van het medisch curriculum.

2 - The pathologist is a consultant to his fellow clinicians and a vital member of the health care team. In the surgical pathology report the pathologist should reflect on the diagnosis and its biologic and/or therapeutic significance to the patient.

B. M. Wagner: Editorial: The surgical pathology report. Human Pathology 15: 1 (1984)

3 - Voor een optimaal behandelingsbeleid, waarbij inbegrepen de kostenbeheersing van de medische beeldvorming, dient de radiodiagnost reeds vanaf het begin van de diagnostische planning in het overleg te worden betrokken.

4 - Het woord 'kanker' heeft in het Nederlandse taalgebruik een negatieve bijklank door andere redenen dan alleen ziektekundige. Daarom verdient het aanbeveling begrippen zoals bijvoorbeeld 'kwaadaardige ziekten' en 'oncologie' meer algemeen ingang te doen vinden.

5 - Kwaadaardige ziekten kan men vaak curatief behandelen; vele andere ziekten niet.

6 - De praktijk leert, dat het geen open deur intrappen is om opnieuw de stelling te verdedigen dat zowel het vaginale als het rectale onderzoek behoort tot een vereist standaardonderdeel van het algemeen lichamelijk onderzoek.

7 - Ook de natuur dient, op indicatie, een kans te hebben om als geneesheer op te treden.

8 - 'Onderwijs is een maaltijd en geen toetje.'

Marokkaans spreekwoord

9 - Het verdient aanbeveling dat iedere (medische) docent kennis neemt van de 'Dr. Fox experiments'.

10 - Iemand die een camera kan vasthouden is niet per definitie in staat om een audiovisueel onderwijsprogramma te maken.

11 - Ook voor het ontwerpen van een audiovisueel onderwijsprogramma geldt: 'Schoenmaker, houd je bij je leest.'

12 - Iets tot stand te willen brengen vereist een voortdurende interactie met de omgeving.

13 - In uitspraken over Amerika wordt dikwijls vergeten dat de Verenigde Staten zijn samengesteld uit 50 landen.

14 - Wij moeten allen inleveren. Deze promovendus stelt daartoe voor bij het begroetings- en felicitatieceremonieel de moderne meerdere vluchtige kussen in te leveren tegen een ouderwetse stevige handdruk.

Groningen, 5 juni 1985.

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Emilie Lini Haagedoorn
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Mondeel B.V. – Amsterdam

Promotores: Prof. Dr. J. Oldhoff

Prof. R. F. Bakemeier, M.D.

UNIVERSITY OF GRONINGEN
The Netherlands

ASPECTS OF CANCER EDUCATION FOR PROFESSIONALS

THESIS

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CONTENTS

INTRODUCTION

Cancer is widespread. This imposes great responsibility in medical care and medical education. Within the past two decades considerable progress has been made in cancer research and in multidisciplinary cancer patient management. Survival rates of several malignant diseases have improved. It is recognized that early diagnosis is one of the means by which survival rates can increase even more. Therefore cancer should receive increasing attention in medical schools.
The practicing physician, general physicians in particular, are the persons on whom people must rely for their primary medical care. It is of great importance in cancer education to find a balance between general principles and specialized knowledge, permitting general physicians to know how to provide advice on cancer prevention, early cancer diagnosis, adequate ways of referral, and adequate emotional support for cancer patients.
Fundamental in oncology is the multidisciplinary approach in patient management. Oncology may require the activities of a broad variety of disciplines. Consequently in cancer education a broad range of educational resources is involved. It is recognized that such education benefits from coordination and integration, otherwise it results in fragmented, incoherent educational experiences, thereby suffering from unfortunate omissions and needless duplications of effort.

One of the practical problems in planning the medical curriculum is the time allocated to various medical disciplines.
Shortly after one another two important reports have been published. In the U.S.A., in 1980, a six-volume report on 'Cancer Education in the U.S. Medical, Dental and Osteopathic Schools' was published by the U.S. Department of Health and Human Services. In Europe, in 1981, an U.I.C.C./W.H.O. report became available on 'Undergraduate Cancer Education in the European Region'.
Both reports published findings and recommendations on undergraduate cancer education in medical schools. In addition, the U.S. reports give a detailed description of the organization and data collection instruments, used in the U.S. nationwide survey, together with clear insight information in causes and effects. In this way the U.S. Cancer Education Survey allows individual interpretation of the study results, which are of value to medical schools who want to innovate their teaching programs in cancer.
In both reports the importance of coordination and integration in a multi-

disciplinary cancer curriculum is emphasized. In this context the background of this thesis is twofold.
First, it was considered of interest to investigate some aspects of cancer education in the Netherlands by using the data collection instruments from the U.S. Cancer Education Survey. If these instruments proved to be useful also outside the U.S.A., this could be considered of value for medical schools in other countries too.
Secondly, considering the fact that one of the fundamentals of the above mentioned coordination and integration is to avoid needless duplications of effort and unfortunate omissions, it is of utmost importance to look for and to develop learning aids that contribute to a multifaceted medical education system within the time constraints of a medical curriculum.
In this thesis an effort is made to point out the potentials of instructional audiovisual programs especially designed to present basic multidisciplinary oncology information on particular malignant diseases, thus leaving the professional teachers more time for their own cancer teaching.

The information in this thesis is primarily aimed at faculty members of medical schools and cancer institutes, administrators and other health care officials.
Part of the thesis is also aimed at producers, medical illustrators and educationists, who want to take advantage of the manner that was developed in producing and evaluating multidisciplinary and multi-institutionally produced audiovisual cancer education programs.

In Chapter 1 is presented a brief delineation of the design and a few outcomes from the U.S. Cancer Education Survey which have served as a basis for the Dutch Cancer Education Study. For those readers who are interested in more information on important findings from the U.S. Cancer Education Survey, a more extensive review is added in Appendix A.
In Chapter 2 the results are presented of a study of some aspects of cancer education in the Netherlands, pertaining to features of institutional environments with regard to cancer education, and pertaining to activities and attitudes of faculty members concerning cancer education.
Chapter 3 provides a review of the evolution of instructional audiovisual materials. It is followed by a description in Chapter 4 of the availability and use of audiovisual cancer education materials in the Netherlands.
In Chapter 5 detailed information is given of the production procedures pertaining to multidisciplinary and multi-institutionally approached audiovisual cancer education programs as developed by the Dutch National Cancer Education Project.
In Chapter 6 a study is discussed pertaining to the question whether different target groups can benefit from the same audiovisual cancer education program, designed with multidisciplinary medical input.

CHAPTER 1

EXCERPTS FROM A CANCER EDUCATION SURVEY IN THE U.S.A., USED AS A BASIS FOR A CANCER EDUCATION STUDY IN THE NETHERLANDS

1.1 INTRODUCTION

1.1.1 Introduction

In the United States of America a nationwide Survey on cancer education activities in 110 from (in 1976) 114 operational medical schools was performed during the period August 1976 - December 1979. This 'Cancer Education Survey' was accomplished by the American Association for Cancer Education in contract with the National Cancer Institute of the U.S. Department of Health and Human Services.
This Survey provides results which are of value to medical schools who want to innovate their teaching efforts in cancer.

1.1.2 History

In a 1946 report on cancer facilities and services, presented by the U.S. National Advisory Cancer Council, it was recommended that a conference of representatives responsible for the planning of instruction in schools of medicine be called with the purpose of developing improved methods of cancer teaching. The assembled conference was held at the National Cancer Institute (N.C.I.), November 1946.
The members of the conference, under chairmanship of Dr. Frank E. Adair, included eight Deans, nine Professors of Surgery, a Professor of Pathology and a Professor of Hygiene – from 14 medical schools – and representatives of the National Research Council, the American Cancer Society, the National Advisory Cancer Council, and others from the Public Health Service.[1]
Among the different topics discussed at the conference, there was one leading theme: the call for coordination of cancer teaching and other cancer activities in the medical school through one individual, someone with a broad knowledge on diverse aspects of cancer. The general opinion was that cancer education in medical schools was hampered by being fragmented among several departments and by lacking coordination. It was recognized that student cancer education involved the activities of several departments and many diverse faculty members of a school and therefore would benefit from coordination.
The Committee made several recommendations and stressed on coordina-

tion and integration. Furthermore one of the recommendations expressed that the U.S. Public Health Services should consider ways and means of providing necessary financial assistance to interested medical schools prepared to undertake an integrated program of cancer teaching.

In 1947, the National Cancer Institute, with approval of Congress, inaugurated a program of Cancer Education Grants for undergraduate medical students 'to stimulate and increase the knowledge of cancer, and learning techniques of diagnosis and treatment'.

Grant programs have continued ever since in various forms.

The Cancer Education Grants in funded medical schools were supervised by one or more faculty members with specific expertise in cancer, and who were designated as Cancer Education Program Director, or Cancer Education Coordinator. Since 1948 Cancer Education Coordinators met annually for the specific purpose of information exchange concerning cancer education activities and innovations; and to review cancer education techniques.

In 1958 a Committee of Cancer Education Coordinators, under the chairmanship of Dr. Kenneth B. Olson, reported an analysis of the impact and results of the Cancer Education Funding Program over the period of 1949-1957.[47] Funds were seen to have aided many schools in developing and expanding a subdepartment concerned primarily with the cancer problem in teaching, in research or in service to patients.

Some results of the analysis were:

- New methods of analysis of medical teaching effectiveness were executed on a national basis in order to attempt to document quantitatively the results of the cancer teaching program.[17, 60]
- Cancer learning had improved as evidenced by the results of an annual examination on the subject of cancer over the period 1949-1957.[18, 19, 61, 62, 71]
- Additional teaching personnel was added to the faculty of several medical schools, personnel with main interest in cancer.[25, 37, 38]
- Student fellowships were established.
- Postgraduate cancer education had increased.

The finding of a complete lack of standardized cancer education programs was considered remarkable.

The annual meetings of the Cancer Education Coordinators resulted in 1966 in the founding of the American Association for Cancer Education, the A.A.C.E. Many Cancer Education Coordinators in the A.A.C.E. recognized that a core curriculum in cancer-related topics for medical students should provide enough fundamental aspects of cancer. This core curriculum, along with appropriate continuing cancer education programs, should permit future physicians and surgeons in all fields to have an adequate knowledge of cancer diagnosis, a basic appreciation of current optimal cancer patient management, and appropriate attitudes toward the psychosocial problems of cancer patients.

It was observed, that some professional schools had developed educational systems that coordinated the broad field of cancer education and had achieved a high degree of success in transmitting appropriate information and attitudes about cancer to their students.

In recognition of the important role of cancer education, the Division of Cancer Control and Rehabilitation of the National Cancer Institute requested in 1974 the A.A.C.E. to conduct a survey 'to document, classify and assess the current status of cancer education in the medical, dental and osteopathic schools in the U.S.A.'. This resulted in the above mentioned Cancer Education Survey.[3, 4, 5, 6, 7, 8]

By documenting the cancer education methods used in virtually all the medical, dental and osteopathic schools in the U.S.A., the Cancer Education Survey sought to record and analyze the cancer education programs which appeared most effective.

Factors considered in determining the scope and effectiveness of cancer education programs during the Cancer Education Survey were:

- the characteristics of the professional institutions
- the design of their curricula (in general and pertaining specifically to cancer education)
- the nature of the faculty members involved in cancer education programs
- the availibility of cancer patients in these programs
- the cancer-related experiences and attitudes of students
- the role of various sources of funding.

1.1.3 **The objective of the Dutch Cancer Education Study**

The extensive work of the U.S. Cancer Education Survey is scarcely known outside the United States of America. It was considered of interest to get an impression concerning some aspects of cancer education in the Netherlands by using data collection instruments from the U.S. Cancer Education Survey.

The aspects considered for the Dutch study pertained to:

1 - Features of institutional environments with regard to cancer education.

2 - Activities and attitudes of medical school faculty members concerning cancer education.

For this reason the U.S. Survey Design and a few outcomes from the U.S. Survey will be briefly delineated in this chapter. These selected outcomes have served as the basis for the Dutch Study (Chapter 2). A more complete review with most of the important findings from the U.S. Cancer Education Survey are abstracted in Appendix A.

1.2 SURVEY DESIGN U.S. CANCER EDUCATION SURVEY

1.2.1 Organizational structure

The U.S. Cancer Education Survey was conducted by the American Association for Cancer Education in an organizational structure as represented in Fig. 1.

Fig. 1. Organizational structure of the U.S. Cancer Education Survey. (A.A.C.E.: American Association for Cancer Education; N.C.I.: National Cancer Institute; A.A.M.C.: Association of American Medical Colleges; A.A.C.O.M.: American Association of Colleges of Osteopathic Medicine; A.A.D.S.: American Association of Dental Schools)

The Survey was conducted by the Principal Investigator in close cooperation with Associate Principal Investigators, the Analysis Director and the Survey Consultants (A.2.1).

1.2.2 **Data collection instruments**

Four data collection instruments were designed:

I - Educational Resources Questionnaire for medical and osteopathic schools (E.R.Q.).
II - Educational Resources Questionnaire for dental schools.
III - Faculty and Curriculum Questionnaire for medical and osteopathic schools (F.C.Q.).
IV - Student Questionnaire for medical and osteopathic schools (S.Q.).

1.2.3 **Response rates**

In the E.R.Q. phase of the U.S. Survey 110 from 114 medical schools participated, while in the F.C.Q. phase and the S.Q. phase of the Survey 95 medical schools participated.
The outcomes of the U.S. Survey for dental schools are not given in this thesis. However, it is worth recording that 55 of the 58 dental schools operational in 1976 have participated in the Survey.
The Deans' Offices of all 110 participating U.S. medical schools were asked to nominate a faculty member involved in their School's cancer education program, who would thereafter serve as the Institution's Designated Representative to the Cancer Education Survey, and to supervise completion of the Institutional Questionnaires.
The number of completed responses to the Faculty and Curriculum Questionnaire from 2450 faculty members totalled 1311 for an overall response rate of 54%. The 1311 respondents included 993 faculty members of clinical departments, 111 faculty members of pathology departments and 207 faculty members of basic science departments.
Student sampling was performed by sending questionnaires to a random sample of 25% of medical students just completing their preclinical courses, and 25% of the medical students scheduled to graduate in approximately six months.
Completed responses were received from 1861 preclinical students (60% of sample) and from 1757 clinical students (59% of sample).

1.2.4 **Institutional Visits**

In addition to gathering data from the questionnaires, Institutional Visits were made to 44 U.S. medical schools (A.2.4).

1.3 SOME INSTITUTIONAL CHARACTERISTICS FAVORABLE TO THE DEVELOPMENT OF EFFECTIVE CANCER EDUCATION PROGRAMS

1.3.1 **Institutional characteristics**

Presentation of the results of the Institutional Educational Resources phase of the Cancer Education Survey was facilitated by dividing the data into two major sections with a series of subsections. These major topics were:

1 - Characteristics of the *Institutional Environments* which were considered relevant to medical student cancer education programs. These included aspects of financial, administrative, and physical facilities and patient care resources.

2 - *Content of Cancer Education Programs* with relationship to selected institutional characteristics. This included consideration of the variety and multidisciplinary nature of educational activities as well as analysis of specific programs involving outpatient clinics, psychosocial instruction, elective opportunities and oncologic specialty experiences.

In the statistical methods used in the Cancer Education Survey the institutional characteristics were related as independent variables and the content characteristics as dependent variables. In this way an attempt was made to quantify characteristics favorable and unfavorable to the development of effective cancer education programs.

1.3.2 **Coordination of Cancer Education**

The Cancer Education Survey revealed medical school characteristics which appeared to be *favorable* or *unfavorable* to the development of effective undergraduate cancer education programs. One of the important findings was the widespread lack of coordination among medical school departments to facilitate multidisciplinary cancer education activities.

In the context of coordination, school characteristics found to be favorable to the development of effective student cancer education were:

- An effective Cancer Education Coordinator and a multidisciplinary Cancer Education Committee with access to funds specifically designated to cancer education activities. It was widely recognized among faculty members that

the mechanism for interdepartmental coordination for cancer education was a Cancer Education Coordinator or Program Director. An effective Cancer Education Coordinator stimulates and facilitates interdepartmental cancer education.

Schools lacking an active Cancer Education Committee were observed to have cancer education programs which were not coordinated. Even major, widely recognized cancer research and patient care programs had relatively little impact on student cancer education in the absence of coordination, innovation and evaluation which a Cancer Education Coordinator can provide.

- Representation of the Cancer Education Program on the school's Curriculum Committee.

  Lack of such representation, or lack of a close working relationship of the Cancer Education Coordinator with the Dean's Office was found to be an unfavorable characteristic.

1.3.3 **Curriculum structure**

A favorable characteristic in the development of an effective cancer education program appeared to be a disease-oriented educational curriculum permitting a multidisciplinary cancer course or section of a course during the preclinical years.

A rigidly departmentalized curriculum with faculty members exhibiting 'territorial imperatives' and reluctance to participate in interdepartmental integrative activities was found to be an unfavorable characteristic.

Also unfavorable was an organ system-oriented curriculum in which cancer-related material is fragmented system by system, thereby complicating the presentation of general principles of cancer pathobiology. (In this respect a source of concern should be the finding that some cancer-related material was presented in a fragmented, uncoordinated manner, sometimes duplicated in two or more different departmental courses without apparent awareness by one department of what material the other department had presented; or even worse: that members of the same department were not aware of what another staff member had presented on a particular lecture topic.)

1.3.4 **Divisions of Oncology**

Obvious educational advantages were found in the existence of cancer-oriented sections of academic departments, here referred to as Divisions of Oncology. These advantages were based on:

- Facilitation of faculty member recruitment
- Delegation of categorical teaching activities by the Department chairman to faculty members with expertise in specific areas
- Availability of student elective experiences in oncologic subspecialties
- Facilities for interdisciplinary teaching activities.

The Survey also revealed that Cancer Centers, administratively integrated into medical schools, appeared to have positive, but also negative aspects in student cancer education programs.

1.3.5 **Access for students to cancer patients**

Another characteristic found to be favorable for an effective cancer education program was the access for students to adequate numbers of cancer patients – inpatients as well as outpatients – demonstrating both primary and metastatic malignant diseases including common neoplasms. Access to outpatients in particular was seen to be of value in developing positive attitudes by students toward oncology.

1.3.6 **Teaching about multidisciplinary cancer patient management**

The importance of teaching about multidisciplinary patient management was recognized by cancer education faculty members as well as by medical students. However, multidisciplinary cancer patient management conferences appeared to be limited in their student education effectiveness. It was recognized that there was a need to modify such treatment planning conferences to meet student educational needs. This sometimes was done by interjecting brief reviews of topics raised during the discussion of a given patient. Another modification appeared to be the appending of a student interpretive conference after the major conference.

1.3.7 **Other (non-student) levels of cancer education**

The existence of programs in Postgraduate Cancer Education and the existence of cancer-related educational programs for paramedical personnel and the public were found to be favorable for medical student cancer education.

1.3.8 **Financial support specifically for undergraduate cancer education**

The establishment and development of any teaching program within a medical school is facilitated by the availability of financial support which is clearly designated for cancer education. Direct effects of funding were found to be apparent in the form of the establishment of an Office for Cancer Education in the medical school, in stipends for student fellowships and in the importing of visiting speakers and teachers.
Indirect effects of funding were recognized, such as the necessity for assessing the results of cancer education activities and the establishment of cancer education objectives when applying for a Cancer Education Grant. These activities were seen to be associated with the appointment of a Cancer Education Program Director.

1.4 FACULTY MEMBERS: ACTIVITIES AND ATTITUDES CONCERNING CANCER EDUCATION – U.S.A. 1977

Among the profile of cancer teaching activities and attitudes concerning cancer education by 1104 clinical faculty members (including faculty members from pathology departments) engaged in cancer education programs, were the following topics.

1.4.1 **Time commitment to cancer teaching**

Collectively faculty members in the Cancer Education Survey devoted a mean of 45% of their teaching efforts to cancer education. However, there was an increased cancer teaching effort of the oncologic subspecialists with a mean of 90%, except the pediatric oncologists who devoted a mean of 64% to cancer education.

1.4.2 **Expectations regarding cancer education activities and regarding cancer patient care during next 5 years**

About half of the cancer education faculty members expected their own time commitment to cancer teaching would increase over the next 5 years. From 993 faculty members involved in cancer patient care about one fourth to one third expected their cancer patient care activities would increase in the next 5 years.

1.4.3 Attitudes concerning emphasis on cancer in school's curriculum

About half of the faculty respondents felt that cancer was given too little emphasis in their school's curriculum. This was to a great extent the opinion of oncologists; radiation oncologists expressing the strongest agreement with the item.

1.4.4 Expectations concerning change in the school's amount of cancer education in next few years

A majority of the faculty respondents indicated that they expected the amount of cancer education provided to medical students at their own medical school would increase in the next few years.

1.4.5 Attitudes toward a Cancer Curriculum as required material

Seventy-five percent of all faculty respondents felt that a Cancer Curriculum be required for all medical students. More than 90% of clinical oncology subspecialists agreed with that opinion.

1.4.6 Cancer education conducted by a regular Academic Department or by a Division of Oncology

Approximately one third to one half of the faculty respondents felt that cancer education should primarily be conducted by regular Academic Departments rather than by a Division of Oncology or a Cancer Center. About two thirds of clinical oncology subspecialists disagreed with that opinion.

1.4.7 Cancer lecture topics and duplication of efforts

Examination of categories of cancer lecture topics indicated a wide variety of clinical faculty members lecturing on similar cancer-related topics. Duplication of subject matter among several departments in a given school was observed and this was interpreted as indicating a need for a coordinating mechanism such as a multidisciplinary Cancer Education Committee.

1.4.8 **Use of audiovisual aids in cancer teaching**

Faculty members reported a wide range of audiovisual aids in their cancer teaching.

1.4.9 **New cancer instructional materials desired**

New cancer instructional materials desired by faculty respondents were primarily in the areas of diagnosis, treatment, and cellular biology. Interests in such materials centered on slide/tape sets, videotapes and programmed texts.

The topics mentioned in this chapter form the basis for the Dutch Cancer Education Study to be discussed in Chapter 2. However, the study on audiovisual aids in cancer teaching and new cancer instructional materials desired, will be discussed in Chapter 4.

CHAPTER 2

THE DUTCH CANCER EDUCATION STUDY – 1983

2.1 INTRODUCTION

The aim of the Dutch Cancer Education Study was to get an impression of some aspects of Cancer Education in the Netherlands by using data collection instruments from the U.S. Cancer Education Survey. The investigated aspects pertained to:

1 - Features of institutional environments with regard to cancer education.
2 - Activities and attitudes of the clinicians among the medical school faculty members concerning cancer education.

It is recognized that a complete impression of cancer education in medical schools requires the participation of basic scientists and medical students as well as clinicians. However, the limited range of the present Dutch Study dictated that the participation of the former two groups be left for another study.
In the Netherlands there are eight medical schools*. Faculty members of all eight medical schools participated in the Study.

2.2 THE DESIGN OF THE DUTCH CANCER EDUCATION STUDY

2.2.1 Organizational structure

The Dutch Cancer Education Study was performed in 1983. The investigation group was small. The investigator was advised and supervised by two faculty members of the University of Groningen**, and by the Principal Investigator of the U.S. Cancer Education Survey***.

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2.2.2 **Data collection instruments**

2.2.2.1 *Data collection instruments*

In the Dutch Cancer Education Study items for data collection were chosen from the U.S. Educational Resources Questionnaire for medical and osteopathic schools (E.R.Q.), and from the U.S. Faculty and Curriculum Questionnaire for medical and osteopathic schools (F.C.Q.).
In the Dutch Study these will be referred to as the Educational Resources Interview Questionnaire and the Faculty and Curriculum Questionnaire, respectively E.R.I.Q. and F.C.Q.

2.2.2.2 *The Educational Resources Interview Questionnaire – E.R.I.Q.*

It was decided that selected questions from the U.S. Educational Resources Questionnaire were to be used in personal interviews with the eight chairmen of the eight medical schools' Curriculum Committees. These interviews were performed by the investigator.

> This procedure was in contrast to the U.S. Survey, where personal interviews were held during Institutional Visits in addition to gathered data from the E.R.Q.'s. For these Institutional Visits guidelines were developed (A.2.4.3). However, the outline of these questions for interviews were used by a group of three visiting reviewers and were just guidelines. Furthermore, confidential reports of the reviewers were later on compiled in one single report per institution by a subcommittee. This comprehensive procedure could not be applied in a process where the interviews were performed by only one person, without ensuring objectivity.

2.2.2.3 *The Faculty and Curriculum Questionnaire – F.C.Q.*

Questions selected from the U.S. Faculty and Curriculum Questionnaire were sent to all clinical faculty members of the Dutch medical schools, who were Professor and/or Senior Faculty Member of a clinical department.

> This procedure also was in contrast to the U.S. Survey where Designated Representatives (A.2.2.2) in the 110 participating medical schools were responsible for the Questionnaire distribution, completing and returning. The reason for the Dutch procedure was the consideration that in a small country with eight medical schools, it should be possible to reach all faculty members. It was assumed that, within the diverse disciplines,

the chairmen of the various departments and their faculty staff members would nominate one or more members of their discipline to complete the F.C.Q.
In data processing it became evident that this was exactly what had happened.

2.2.3 **Content of the Dutch Questionnaires**

2.2.3.1 *Content of the Educational Resources Interview Questionnaire*

For the Dutch Study the following topics from the U.S. E.R.Q. were chosen for the personal interviews with the chairmen of the eight Dutch Medical School Curriculum Committees.

1 - The existence of a Department of Oncology, a Division of Oncology, or a Cancer Center.
2 - Institutional cancer education structures, such as a Cancer Education Committee or a Division for Cancer Education.
3 - The existence of financial support specifically for undergraduate cancer education.
4 - The existence and frequency of regularly scheduled lecture courses or seminars on cancer for medical students.
5 - The existence and usage of interdisciplinary treatment planning conferences for educational purposes.
6 - The existence of programs in Continuing Cancer Education.
7 - The existence of cancer-related educational programs for paramedical personnel and the public.
8 - A description of anticipated changes in the Institution's cancer education program.

2.2.3.2 *Questions used in the Educational Resources Interviews*

Questions concerning Educational Resources for the Dutch Study were taken from the U.S. E.R.Q. and were sometimes modified to the Dutch national situation. Those questions were used in the interviews with the chairmen of the Curriculum Committees.

1 - Does your medical school have a separate or independent administrative structure such as a Department of Oncology, a Division of Oncology, or a Cancer Center? Yes / No
2 - Does your medical school have:
  • a committee for cancer education? Yes / No
  • a division for cancer education? Yes / No
  • a separate budget for cancer education? Yes / No

- a cancer education program director? Yes / No
- a representative for cancer education on your institution's curriculum committee? Yes / No

3 - Does your medical school have regularly scheduled lectures on cancer topics? Yes / No
If yes, please indicate the specialty.
Hematology / Internal Medicine / Surgery / Radiotherapy / Radiology / Pathology / Pulmonology / Otolaryngology / Gynecology / Pediatrics / Urology / Dermatology / Neurology / Neurosurgery / Epidemiology / Family Medicine / Psychosocial Medicine

4 - Does your medical school have multidisciplinary coordinated lectures on cancer specifically for medical students?
Yes / No. If yes, please indicate in which curriculum year.
1 2 3 4 5 6

5 - Does your medical school have multidisciplinary coordinated seminars on cancer specifically for medical students?
Yes / No. If yes, please indicate in which curriculum year.
1 2 3 4 5 6

6 - Does your medical school have interdisciplinary treatment planning conferences for discussion of clinical cancer problems at least every two weeks? Yes / No
If yes:
- Which disciplines are involved?
  Hematology / Internal Medicine / Surgery / Radiotherapy / Radiology / Pathology / Pulmonology / Otolaryngology / Gynecology / Pediatrics / Urology / Dermatology / Neurology / Neurosurgery
- Do preclinical students attend? Yes / No
  - Is attendance required? Yes / No
- Do clinical students attend? Yes / No
  - Is attendance required? Yes / No
- Is the major conference followed by a review by a faculty member for the medical students?* Yes / No

7 - Does your medical school carry out a program of postgraduate continuing education in cancer-related subjects? Yes / No

8 - Does your medical school conduct educational programs on cancer for nurses, and for paramedical personnel such as radiation technicians / nutritionists / physical therapists / social

*In addition to the U.S. Survey an extra question was added. This was based on the U.S. Survey finding that these interdisciplinary treatment planning conferences were limited in their student education effectiveness; and the importance of modifying such treatment planning conferences to meet student educational needs (A.5.3.3).

service workers? Yes / No

9 - Does your academic hospital conduct educational programs on cancer for nurses, and for paramedical personnel such as radiation technicians / nutritionists / physical therapists / social service workers? Yes / No

10 - Is your Institution planning changes in the educational program that would result in greater emphasis on teaching about cancer? Yes / No

If yes, please describe what plans are contemplated and when these changes will be implemented.

	Implementation			
	date certain		date uncertain	
What changes are contemplated?	within 1 year	within 2 years	decision made	decision not yet made
A _____				
B _____				
C _____				

2.2.3.3 *Content of the Faculty and Curriculum Questionnaire*

For the Dutch Study the following topics from the U.S. F.C.Q. were chosen, and were sometimes modified to the Dutch national situation.

1 - Departmental affiliation of the respondent.
2 - A description of teaching efforts and of patient care responsibilities.
3 - Expectations over the next five years concerning the individual's cancer education and patient care activities.
4 - A listing of cancer teaching activities, including both course lecture titles during preclinical courses as well as during clerkships.
5 - Attitudes concerning the amount of cancer education in the curriculum, and attitudes with regard to whether or not a cancer curriculum should be required for all medical students.
6 - The use of audiovisual aids in cancer teaching.

7 - Desired improvements in audiovisual aids, and suggestions concerning needed new teaching materials.

The topics 6 and 7 are not considered in this chapter. They are further discussed in Chapter 4.

2.2.3.4 *Questions used in the Faculty and Curriculum Questionnaire*

Questions from the U.S. F.C.Q. used in the Dutch Study, sometimes modified to the Dutch national situation, included:

1 - Do your lecture teaching responsibilities include structured cancer education lectures? Yes / No
If yes:
a - How many lecture hours per year?
_____ hours
b - What percentage of your teaching efforts is devoted to cancer education?
_____ %

2 - a - How many cancer patients do you see weekly?
approximately _____ inpatients
approximately _____ outpatients
b - What percentage of your patients are cancer patients?
± _____ %

3 - a - During the course of the next 5 years do you think you will spend more time / less time / or about the same time on cancer education?
b - During the course of the next 5 years do you think you will spend more time / less time / or about the same time on cancer patient care.

4 - Please indicate on which cancer topics you have lectured on during the course of 1982/1983?
Topics: *(on the questionnaire space for 24 topics)*
How many lecture hours on the same topic?
Student curriculum year in which taught.
Mean percentage of students that attended the lectures.

5 - Does your department provide structured cancer education lecture courses for clinical students? (Bedside teaching excluded.) Yes / No
If yes, Topics?
Number of interns per course.
Frequency of these lecture courses per year.
How many weeks is the clerkship in your department?
Mean number of hours devoted to oncology during clerkship.

6 - Over all, which of the following statements best describes what you expect your institution will do in cancer education for medical students in the next few years?
   a - Increase the time devoted to cancer education.
   b - Keep the time devoted to cancer education as it is now.
   c - Decrease the time devoted to cancer education.
   What percentage increase or decrease do you expect?
7 - For each of the following statements, circle 'agree', 'disagree', or 'not sure' for the term which best describes your agreement or disagreement with the statement:
   a - Cancer is given too little emphasis in the curriculum of my medical school.
   b - Cancer education should be primarily conducted by a regular Academic Department, rather than by a Division of Oncology.
   c - A cancer curriculum should be required for all medical students.

The questions 8 till 14 will be discussed in Chapter 4.

2.2.4 **Response rates**

2.2.4.1 *Response rates for the Educational Resources Interviews*

There were no refusals. The interviews concerning aspects of Educational Resources for the Dutch Cancer Education Study were performed in all eight medical schools.

2.2.4.2 *Response rates for the Faculty and Curriculum Questionnaires*

Three hundred and sixty-five questionnaires were mailed to faculty members of 191 clinical departments of the eight medical schools.
Two hundred and twenty-four questionnaires (61%) were returned from 165 departments (86%). Fifty of these 224 returned questionnaires were not usable for evaluation for three main reasons.

I - Twelve were sent back with a kind note that the questionnaire would be filled in by another faculty member of the department.

II - Twenty-four were sent back not filled in, with a remark such as:
   'Refuse to cooperate.'
   'Don't see the value of my cooperation.'

'Tired of questionnaires.'

III – Fourteen were not evaluable because they were incomplete, or contained too many additional remarks without using the coding of the questionnaire.

This reduced the participating clinical departments by another 24, tot 141 departments of the eight medical schools.

The number of completed usable responses from the questionnaires mailed to 365 faculty members totalled 174, from 141 departments; an overall response rate of 48% of faculty members representing 74% of the responding departments of the eight medical schools.

2.3 THE RESULTS FROM THE DUTCH EDUCATION RESOURCES INTERVIEWS, RELATED TO THE PERIOD SEPTEMBER 1982 - SEPTEMBER 1983

2.3.1 Cancer education environments

In the Netherlands there are no independent structures within the medical schools such as a Department of Oncology or a Cancer Center. However, there are several Divisions of Oncology.

Three medical schools have a Division of Medical Oncology. In one of these three schools the Division of Medical Oncology is closely related to the Department of Radiation Oncology. The other five medical schools each have a subdivision of Medical Oncology.

Two schools have a Division of Surgical Oncology.

In 1983 seven of the eight medical schools had a Department or Institution of Radiation Oncology. In the same year, the eighth medical school had an affiliation with an Institution of Radiation Oncology already existing in a hospital in a nearby town.

2.3.2 Institutional cancer education characteristics

A Division for Cancer Education does not exist in any of the eight medical schools.

A Cancer Education Committee exists in two of the eight medical schools, with only one of those two schools having a representative for cancer education on the Institution's Curriculum Committee.

In none of the eight medical schools a Cancer Education Program Director or Cancer Education Coordinator is appointed. However, in five schools such a function is performed on a voluntary basis by one of the staff members.

2.3.3 **Financial support specifically for undergraduate cancer education**

A separate budget for undergraduate cancer education does not exist in any of the eight medical schools.

2.3.4 **Structured lecture courses on cancer topics for medical students**

Structured lecture courses on cancer topics were indicated in the following specialties:

• Gynecology	8 schools
• Internal Medicine / Radiation Oncology / Dermatology / Pathology	7 schools
• Pediatrics / Hematology / Otolaryngology / Urology / Pulmonology	6 schools
• Neurology / Epidemiology	4 schools
• Surgery / Neurosurgery	3 schools
• Diagnostic Radiology	1 school
• Family Medicine	0 schools

It should be recognized that these figures may give a wrong impression of the amount of cancer education in one specialty. Within the specialties in the different schools there also existed a wide range in the numbers of hours devoted to cancer education. This might simply consist of two lectures in one school and twenty lectures in the same discipline in another school.

In six of the eight medical schools the existence of multidisciplinary coordinated lectures on undergraduate cancer education was indicated. These lectures most frequently took place in the third or fourth curriculum year. There was a wide range in the amount of coordinated lectures between different schools, ranging from two lectures in one school to a seminar of two weeks in another school.

2.3.5 **Interdisciplinary treatment planning conferences**

In all eight medical schools the existence of interdisciplinary treament planning conferences for discussion on clinical cancer problems at least every two weeks was indicated. Different disciplines were involved, depending on patient cases.

From the eight medical schools it was reported that in two schools preclinical students could attend the meetings. Attendance was not required.

In all eight medical schools clinical medical students could attend the meetings. In four schools attendance was required.

For three out of the eight medical schools it was indicated that the major multidisciplinary conference was not followed by an interpretive review for medical students. For the other five schools it was reported that there was no formal interpretive discussion for the students, but that this was possibly done by some faculty members on an ad hoc basis.

2.3.6 **Programs in Continuing Cancer Education**

All eight medical schools carry out a program on continuing education in cancer or cancer-related subjects. The recently founded (in the last decade) Comprehensive Cancer Centers play an important role in postgraduate cancer education.

2.3.7 **Cancer-related educational programs for nurses and paramedical personnel**

No cancer education programs for nurses, radiation technicians, or for other paramedical personnel exist in any of the eight medical schools.
The Departments of Radiation Oncology train their own radiation technicians, who are required to take successfully a national exam, designed by the Dutch Association for Radiation Technicians.
In several academic hospitals (and in other non-academic hospitals as well as in the two Cancer Institutes*) there is quite a lot of activity concerning cancer education for nurses. However, there is no structured planning within any of the medical schools.

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*The Netherlands Cancer Institute in Amsterdam and the Rotterdam Radiotherapeutic Institute in Rotterdam.

2.3.8 **Anticipated changes in the school's cancer education program**

At the time of the Dutch Study (1983) changes in the school's cancer education program were anticipated in seven of the eight medical schools.

In four schools more time in the medical curriculum was going to be designated for cancer education. The decision was made, and implementation was expected within one or two years.

Multidisciplinary oncology lecture courses were anticipated in five schools, in three of which the implementation was expected within one year, and in two within two years. In one medical school the subject of multidisciplinary integrated cancer education was still under discussion.

Other changes anticipated – all of which were expected to be implemented within one year – were (each topic in one school):

- The institution of five minisymposia per year on a medical topic, with oncology occasionally as the theme
- Cancer electives
- More integration with basic sciences in an already existing multidisciplinary lecture course
- Structured multidisciplinary lectures in the first curriculum year on clinical cancer topics, combined with epidemiology and histopathology
- More outpatient contacts.

2.4 THE RESULTS OF THE DUTCH FACULTY AND CURRICULUM QUESTIONNAIRE – 1983

2.4.1 **Characteristics of the medical faculty respondents**

Information from 174 faculty members from all eight medical schools constituted the data base of the results from the Dutch Faculty and Curriculum Questionnaire.
For data processing in the Dutch Study the main outlines from the U.S. Cancer Education Survey were followed as far as the categorization of seven main groups: Surgery / Internal Medicine / Radiology* / Gynecology / Pediatrics / Pathology / and 'Others'.
However, in classifying Specialty Oncologists, a second group was introduced in the Dutch Study (see next paragraph).
In the U.S. Cancer Education Survey the criteria employed for classifying faculty respondents as Specialty Oncologist were a priori selected. These

*See Section 2.4.2.

criteria were based on the respondent's reported percentage of patients having cancer. If the cancer patients for whom the faculty member had responsibility constituted the following designated percentage of his/her total patients, he/she was classified as a Specialty Oncologist.

Surgical Oncology	90%
Medical Oncology	90%
Radiation Oncology	90%
Gynecologic Oncology	90%
Pediatric Hematology/Oncology	67%

The (arbitrary) criterion for pediatric oncologists was fixed at a lower percentage of patients having cancer, since hereditary and acquired non-malignant hematologic diseases constitute a significant proportion of clinical responsibility in the Pediatric Hematology/Oncology specialty.

In the Dutch Study the same criteria were adopted.
'*Specialists*' were, in conformity with the U.S. Cancer Education Survey, all respondents to the Faculty and Curriculum Questionnaire. They will be referred to in a group T (Total).
'*Oncologists*' were, in conformity with the U.S. Survey, all specialists who met the (arbitrary) classification as Specialty Oncologist. They will be referred to in a group A.
However, in addition to these specialists classified in group A, a second group of specialty oncologists was introduced in the Dutch Study. The reason was, that in 1983, in the Netherlands, there were quite a lot of specialists in the academic hospitals, who treated the cancer patients in their departments, and who were recognized by oncologists as having expertise in oncology. For different reasons they did not meet the (arbitrary) criterion for classification as specialty oncologist; most frequently because their department did not have an administrative structure like a division of oncology or an oncology unit, and in consequence they were also involved in other clinical tasks in their department. As they were recognized for their *expertise in oncology*, these specialists will be referred to in a separate group B.*
All specialists, not identified in group A or B will be referred to in group N-O (*Non-Oncologists*).

*Group B was compiled by the investigator of the Dutch Study in consultation with one of the supervisors, both being acquainted with the names of specialty oncologists in the Netherlands. Only in 5 (out of 40) cases there was doubt concerning the extent of involvement in oncology of a specialist who was unknown to the investigator and the supervisor. Consultation with (A-)oncologists in the hospitals concerned, categorized all 5 in group B.

For obtaining the classification data for the above-mentioned groups the following questions were used:

- Name and departmental affiliation of the respondent
- How many cancer patients do you see weekly?
- What percentage of your patients are cancer patients?

Because of the small numbers of specialists involved in the diverse specialty groups, the results of these questions are not published in detail in order to ensure confidentiality.

2.4.2 **Medical faculty members categorized by major departmental affiliation**

Categorization by major departmental affiliation of the responding faculty members represented in the Dutch Study was accomplished in conformity with the categorization used in the U.S. Cancer Education Survey. This was done in order to leave the possibility of comparing observations.
It is recognized that the term 'Radiology' comprises two quite different specialties: Radiation Oncology and Diagnostic Radiology. With the differentiation of groups A and N-O it is evident that group A consists of the Radiation Oncologists, and group N-O of the Diagnostic Radiologists.
To keep the conformity with the U.S. Survey, the term Radiology was thus maintained.
The categorization data are presented in Table 1.

TABLE 1.
MEDICAL FACULTY MEMBERS CATEGORIZED BY MAJOR DEPARTMENTAL AFFILIATION.

(T = Total – all respondents; A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

Respondents (174)	T	Number of schools	A	Number of schools	B	Number of schools	N-O	Number of schools
Surgery[1)]	40	8	5	3	14	7	21	8
Internal Medicine[2)]	34	8	8	8	13	6	13	6
Radiology[3)]	15	8	8	8	–	–	7	6
Gynecology	7	7	5	5	–	–	2	2
Pediatrics	8	7	4	4	2	2	2	2
Pathology	8	6	–	–	2	2	6	4
Others[4)]	62	8	–	–	9	5	53	8
Respondents	174		30		40		104	

[1)]Surgery (40), including general surgery 11, urology 6, cardiothoracic surgery 2, plastic surgery 3, neurosurgery 6, orthepedic surgery 4, otolaryngology 7, pediatric surgery 1.
[2)]Internal medicine (34), including internal medicine 12, hematology 4, pulmonology 7, immunology 4, gastroenterology 2, nefrology 2, infectious diseases 1, hepatology 1, endocrinology 1.
[3)]Radiology (15), including therapeutic radiology 8, diagnostic radiology 6, nuclear medicine 1.
[4)]Others (62), including dermatology 7, neurology 9, psychiatry 5, medical psychology 6, general practice 7, epidemiology 4, ophthalmonology 8, rehabilitative medicine 1, dentistry 11, others 4.

2.4.3 **Time commitment to cancer teaching**

Faculty members were asked about the amount of cancer-related teaching in proportion to all their undergraduate teaching activities in structured lectures during one curriculum year. Total of cancer education hours plus mean percentages of teaching time devoted to cancer education per specialty group is reported over the period September 1982 - September 1983.

Question: 'Do your lecture teaching responsibilities include structured cancer education lectures?' Yes / No

If yes:

a - How many lecture hours per year?
_____ hours

b - What percentage of your teaching efforts is devoted to cancer education?
_____ %

Although 159 (91%) of the 174 participating faculty members in the Study responded to the topic, only 111 respondents (64%) completed both questions. The results are presented in Table 2.

TABLE 2.
THE DISTRIBUTION OF TEACHING EFFORTS IN REFERENCE TO CANCER EDUCATION REPORTED BY 111 FACULTY MEMBERS, FOR THE PERIOD SEPTEMBER 1982 - SEPTEMBER 1983.

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (26)*			B (38)			N-O (47)		
Respondents (111)	Faculty members	Mean amount of cancer lectures per year	Mean % of total lecture hours per year	Faculty members	Mean amount of cancer lectures per year	Mean % of total lecture hours per year	Faculty members	Mean amount of cancer lectures per year	Mean % of total lecture hours per year
Surgery (29)	5	14	97	14	8	31	10	6	19
Internal Medicine (24)	6	22	100	13	7	34	5	6	14
Radiology (7)	6	11	91	-	-	-	1	4	25
Gynecology (6)	5	7	42	-	-	-	1	5	30
Pediatrics (7)	4	6	51	2	3	35	1	2	5
Pathology (5)	-	-	-	1	43	25	4	24	21
Others (33)	-	-	-	8	10	24	25	4	9
Mean	A	12	79	B	8	31	N-O	6	13

*Figures in parentheses are number of faculty respondents to this topic.

2.4.4 **Expectations regarding cancer education activities during the next 5 years (1983-1988)**

Faculty members were asked about their expectations regarding their cancer education activities in the course of the next 5 years (1983-1988).

Question: 'During the course of the next 5 years do you think you will spend more time / less time / or about the same time on cancer education?'

The topic was evaluated for 158 (91%) from the 174 participating faculty members in the Study. From the 16 respondents not evaluated 2 faculty members were going to retire within one year, 10 respondents replied: 'not involved in cancer education', and 4 faculty members did not complete this particular question. The results are presented in Table 3.

TABLE 3.
EXPECTATIONS OF FACULTY MEMBERS REGARDING AMOUNT OF CANCER EDUCATION ACTIVITIES DURING THE COURSE OF THE NEXT 5 YEARS (1983-1988).

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (29)*			B (38)			N-O (91)		
Respondents (158)	More	Same	Less	More	Same	Less	More	Same	Less
Surgery (39)	2	2	-	6	8	-	7	13	1
Internal Medicine (34)	8	-	-	2	10	1	1	11	1
Radiology (10)	4	4	-	-	-	-	1	1	-
Gynecology (7)	2	3	-	-	-	-	2	-	-
Pediatrics (8)	3	1	-	-	-	-	-	4	-
Pathology (7)	-	-	-	2	-	-	-	5	-
Others (53)	-	-	-	2	7	-	13	29	2
Total	9	10	-	12	25	1	24	63	4
Percentages	66%	34%		32%	66%	2%	26%	69%	5%

*Figures in parentheses are number of faculty respondents to this topic.

2.4.5 **Expectations regarding cancer patient care activities during the next 5 years (1983-1988)**

The question of faculty members' expectations regarding their cancer education activities during the next 5 years (2.4.4) was combined with a question about their expectations concerning cancer patient care activities in the course of the same period (1983-1988).

Question: 'During the course of the next 5 years do you think you will spend more time / less time / or about the same time on cancer patient care?'

The topic was evaluated for 149 (86%) of the 174 participating faculty members in the Study. From the 25 faculty members not evaluated 2 were going to retire within one year, 14 were not involved in cancer patient care, 5 were not involved in diagnostic procedures in cancer patients, and 4 faculty members did not complete this particular question. The results are presented in Table 4.

TABLE 4.
EXPECTATIONS OF FACULTY MEMBERS REGARDING THE AMOUNT OF CANCER PATIENT CARE ACTIVITIES DURING THE COURSE OF THE NEXT 5 YEARS (1983-1988).

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (28)*			B (37)			N-O (84)		
Respondents (149)	More	Same	Less	More	Same	Less	More	Same	Less
Surgery (39)	1	3	–	9	5	–	11	9	1
Internal Medicine (33)	6	1	–	8	5	–	3	10	–
Radiology (12)	5	3	–	–	–	–	3	1	–
Gynecology (7)	2	3	–	–	–	–	2	–	–
Pediatrics (8)	2	2	–	1	–	–	–	3	–
Pathology (3)	–	–	–	1	–	–	1	1	–
Others (47)	–	–	–	6	2	–	15	22	2
Total	16	12	–	25	12	–	35	46	3
Percentages	57%	43%		68%	32%		42%	55%	3%

*Figures in parentheses are number of faculty respondents to this topic.

In Table 5 the combined data are listed of faculty expectations with regard to an increase in time allotted to cancer education (2.4.4) in comparison to the expectations concerning their cancer patient care activities (2.4.5) in the next 5 years.

TABLE 5.
EXPECTED INCREASE IN TIME ALLOTMENT TOWARD CANCER PATIENT CARE ACTIVITIES AND CANCER EDUCATION ACTIVITIES BY FACULTY RESPONDENTS FOR THE PERIOD 1983-1988.

	More time in next 5 years, from 1983		
	A	B	N-O
Cancer education; 158 respondents	66%	32%	26%
Cancer patient care; 149 respondents	57%	68%	42%

2.4.6 **Attitudes of faculty members concerning the emphasis on cancer in their school's curriculum**

The attitudes of faculty members toward the medical student cancer education program at their school was investigated in an effort to determine the extent of satisfaction by faculty members with the cancer education program. The instrument used for this topic investigation was the following statement.

Statement: 'Cancer is given too little emphasis in the curriculum of my school.'
Agree / Disagree / Not sure

The topic was evaluated for 155 (89%) from the 174 participating faculty members in the Study. All 19 faculty members not evaluated did not complete their opinion on this statement. The results are presented in Table 6.

TABLE 6.
EXTENT OF SATISFACTION OF FACULTY MEMBERS TOWARD THEIR SCHOOL'S CANCER EDUCATION PROGRAM, INVESTIGATED BY MEANS OF THE STATEMENT: 'CANCER IS GIVEN TOO LITTLE EMPHASIS IN THE CURRICULUM OF MY MEDICAL SCHOOL.' (1983)

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (29)*			B (36)			N-O (90)		
Respondents (155)	Agree	Disagree	Not sure	Agree	Disagree	Not sure	Agree	Disagree	Not sure
Surgery (35)	2	2	–	2	5	4	4	13	3
Internal Medicine (29)	7	1	–	3	5	4	3	3	3
Radiology (13)	4	2	2	–	–	–	2	3	–
Gynecology (7)	2	3	–	–	–	–	1	1	–
Pediatrics (8)	1	2	1	1	1	–	1	1	–
Pathology (7)	–	–	–	2	–	–	–	4	1
Others (56)	–	–	–	2	5	2	11	20	16
Total	16	10	3	10	16	10	22	45	23
Percentages	55%	35%	10%	28%	44%	28%	24%	50%	26%

*Figures in parentheses are number of faculty respondents to this topic.

2.4.7 Expectations of faculty members concerning change in school's amount of undergraduate cancer education in next few years (1983)

In addition to the former investigated topic, expectations of the faculty members were asked regarding changes in their school's amount of undergraduate cancer education in the next few years.

Question: 'Overall, which of the following statements best describes what you expect your institution will do in cancer education for medical students in the next few years?

a - Increase in the time devoted to cancer education.

b - Keep the time devoted to cancer education as it is now.

c - Decrease in the time devoted to cancer education.'

The topic was evaluated for 154 (89%) of the 174 participating faculty members in the Study. From the 20 faculty members not evaluated, 9 noted they had no opinion. The other 11 did not complete this question. The results are presented in Table 7.

TABLE 7.
EXPECTATIONS OF FACULTY MEMBERS CONCERNING A CHANGE IN THEIR SCHOOL'S AMOUNT OF CANCER EDUCATION FOR MEDICAL STUDENTS IN THE NEXT FEW YEARS (1983).

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (30)*			B (36)			N-O (88)		
Respondents (154)	Increase	Same	Decrease	Increase	Same	Decrease	Increase	Same	Decrease
Surgery (39)	-	4	1	5	8	1	7	10	3
Internal Medicine (29)	8	-	-	2	5	4	2	8	-
Radiology (12)	5	3	-	-	-	-	3	1	-
Gynecology (7)	1	4	-	-	-	-	1	-	1
Pediatrics (8)	2	2	-	-	1	1	2	-	-
Pathology (7)	-	-	-	1	-	-	-	4	2
Others (52)	-	-	-	1	5	2	19	18	7
Total	16	13	1	9	19	8	34	41	13
Percentages	53%	43%	3%	25%	53%	22%	39%	46%	15%

*Figures in parentheses are number of faculty respondents to this topic.

2.4.8 **Attitudes of faculty members toward a required cancer curriculum for all medical students**

The attitudes of faculty members concerning the desirability of a required cancer curriculum in undergraduate cancer education was investigated with the following statement.

Statement: 'A cancer curriculum should be required for all medical students.'
Agree / Disagree / Not sure

The topic was evaluated for 156 (90%) of the 174 participating faculty members in the Study. All 18 faculty members not evaluated did not complete this question. The results are presented in Table 8.

TABLE 8.
ATTITUDES OF FACULTY MEMBERS TOWARD THE DESIRABILITY OF A REQUIRED CANCER CURRICULUM FOR ALL MEDICAL STUDENTS (1983).

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (30)*			B (37)			N-O (89)		
Respondents (156)	Agree	Disagree	Not sure	Agree	Disagree	Not sure	Agree	Disagree	Not sure
Surgery (37)	5	-	-	11	1	-	15	4	1
Internal Medicine (29)	8	-	-	10	1	1	7	2	-
Radiology (13)	8	-	-	-	-	-	4	1	-
Gynecology (7)	5	-	-	-	-	-	2	-	-
Pediatrics (8)	4	-	-	2	-	-	2	-	-
Pathology (6)	-	-	-	2	-	-	2	2	-
Others (56)	-	-	-	7	-	2	33	10	4
Total	30	-	-	32	2	3	65	19	5
Percentages	100%			87%	5%	8%	73%	21%	6%

*Figures in parentheses are number of faculty respondents to this topic.

2.4.9 **Attitudes of faculty members toward cancer education conducted by a regular Academic Department, or by a Division of Oncology**

Another impression on attitudes of faculty members toward the undergraduate cancer education program at their school was gathered by measuring their opinion on the desirability of direction of cancer education by a regular Academic Department, rather than by a Division of Oncology.

Statement: 'Cancer education should be primarily conducted by a regular Academic Department, rather than by a Division of Oncology.' Agree / Disagree / Not sure

The topic was evaluated for 156 (90%) of the 174 participating faculty members in the Study. All 18 faculty members not evaluated did not complete this particular question. The results are presented in Table 9.

TABLE 9.
ATTITUDES OF FACULTY MEMBERS TOWARD THE DESIRABILITY OF CONDUCTING CANCER EDUCATION BY A REGULAR ACADEMIC DEPARTMENT, RATHER THAN BY A DIVISION OF ONCOLOGY (1983).

(A = Oncologists; B = Expertise in oncology; N-O = Non-Oncologists; see 2.4.1)

	A (30)*			B (36)			N-O (90)		
Respondents (156)	Agree	Disagree	Not sure**	Agree	Disagree	Not sure**	Agree	Disagree	Not sure**
Surgery (37)	1	4	–	2	7	2	9	12	–
Internal Medicine (29)	2	4	2	3	7	2	5	3	1
Radiology (13)	1	7	–	–	–	–	4	–	1
Gynecology (7)	1	3	1	–	–	–	–	2	–
Pediatrics (8)	1	3	–	–	2	–	2	–	–
Pathology (7)	–	–	–	2	–	–	1	2	2
Others (55)	–	–	–	1	5	3	26	15	5
Total	5	22	3	8	21	7	47	34	9
Percentages	17%	73%	10%	22%	58%	20%	52%	38%	10%

*Figures in parentheses are number of faculty respondents to this topic.
**Nineteen of the 156 respondents were not sure about the statement; 17 of these 19 respondents made an additional remark: 'If there is an Oncology Unit within the regular Academic Department, cancer education should be primarily conducted by the Oncology Unit.'

2.4.10 **Major cancer-related topics lectured in preclinical years**

A profile of cancer-related topics taught by faculty members in regular lectures during the course September 1982 – September 1983, is presented in Table 10.

In the original planning of the Dutch Cancer Education Study, the intention was to investigate a more detailed profile of lecture topics within each of the eight medical schools. However, in processing the data it soon became apparent that it was not possible to guarantee anonimity. Nevertheless, it can be mentioned, that in some medical schools a coordinated multidisciplinary approached oncology lecture course for medical students was performed, whereas in other medical schools there appeared to be no coordination at all.

For data processing on this topic it was decided to render an overall profile of cancer topics taught by faculty members in regular lectures by categorizing in order of frequency specific lecture titles enumerated collectively by all faculty respondents.

Question: 'Please, indicate on which cancer topics you have lectured on during the course 1982/1983.'

- Topics: *(on the questionnaire space for 24 topics)*
- How many lecture hours on the same topic?
- Student curriculum year in which taught.
- Mean percentage of students that attended the lectures.

Part of this topic is evaluated for 136 (78%) of the 174 participating faculty members in the Study. From the 38 faculty members not evaluated 33 did not complete this particular question at all, and 5 questionnaires were completed inadequately.

The subquestions concerning the amount of lectures on the same topic and the mean percentage of student attendance were completed adequately by only 8 faculty respondents and less adequate by another 5 respondents. For this reason those two subquestions have been withdrawn from data processing.

TABLE 10.
A PROFILE OF CANCER LECTURE TOPICS IN ORDER OF FREQUENCY NAMED BY 136 FACULTY MEMBERS IN 8 MEDICAL SCHOOLS (1983).

Respondents (136)*	Total**	Surgery (36)	Internal Medicine (27)	Radiotherapy (7)	Gynecology (5)	Pediatrics (6)	Pathology (6)	Others (42)
Breast cancer	24	6	7	4	–	–	4	3
Lung cancer	24	3	11	3	–	–	5	2
Gastrointestinal cancers	22	9	7	–	–	–	4	2
General aspects	19	5	2	2	1	3	5	1
Urologic malignancies	19	7	5	1	–	1	4	1
Skin cancers	19	8	–	–	–	–	3	8
CNS neoplasms	16	5	–	–	–	1	3	7
Head and neck tumors	15	10	–	2	–	–	2	1
Bone tumors	13	5	5	1	–	–	2	–
Gynecologic cancers	13	–	1	2	5	–	4	1
Leukemia	12	–	5	–	–	4	2	1
Lymphomas (all)	12	–	6	2	–	1	2	1
Psychosocial aspects	11	–	2	1	1	–	–	7
Radiation oncology	11	–	1	7	1	–	–	2
Endocrine tumors	10	5	2	–	–	–	2	1
Epidemiology	10	–	3	1	1	–	–	5
Chemotherapy	9	–	6	1	1	–	–	1
Childhood tumors	8	2	–	2	–	4	–	–
Metastatic spread	7	4	1	–	–	–	–	2
Tumors of the eye	6	–	–	–	–	–	–	6
Multidisciplinary aspects	5	2	1	1	–	–	–	1
Early diagnosis	4	1	–	1	2	–	–	–
Sarcomas	3	1	–	–	–	–	2	–
Surgical aspects	3	2	–	–	1	–	–	–
Rehabilitative Medicine	1	–	–	–	–	–	–	1
Dentistry/Oncology for medical students	1	1	–	–	–	–	–	–
Carcinogenesis	5	–	1	1	–	–	2	1
Cell kinetics	3	–	2	–	1	–	–	–
Tumor immunology	3	–	2	–	–	1	–	–
Cell membranes	1	–	1	–	–	–	–	–

*Figures in parentheses are number of faculty respondents to the topic.
**Lectures were predominantly in the third and fourth (preclinical) curriculum year.

2.4.11 **Structured lectures on cancer topics during clerkships**

In the Dutch Cancer Education Study a question was added concerning the existence of structured lectures during clerkships (thus excluding bedside teaching). This was investigated in an effort to have an impression of the extent of additional cancer-related teaching for interns in general.

Question: 'Does your department provide structured cancer education lecture courses for clinical students? (Bedside teaching excluded.)' Yes / No
If yes, Topics?
Number of interns per course.
Frequency of these lecture courses per year.
How many weeks is the clerkship in your department?
Mean number of hours devoted to oncology during clerkship.

The topic was evaluated for 129 (74%) of the 174 participating faculty members in the Study, representing 113 (80%) of the 141 departments. The data are presented in Table 11.

From the five subquestions only the one concerning 'topics' was completed adequately by the 129 faculty members named.
From the other four subquestions the last one, concerning mean number of hours devoted to oncology during clinical clerkships was responded adequately by only 31 faculty members who indicated 98 hours being dedicated to oncology during clinical clerkships in their collective departments. Only by one specialty group – otolaryngology – this subquestion was completed by all participating faculty members in this group.
The other three subquestions were completed adequately by only five faculty respondents. For this reason these four subquestions were withdrawn from data processing.

TABLE 11.
STRUCTURED LECTURES ON CANCER TOPICS DURING CLINICAL CLERKSHIPS REPORTED BY 129 FACULTY MEMBERS REPRESENTING 113 CLINICAL DEPARTMENTS (1983).

Specialty	Number of departments	Number of departments with structured cancer lectures for interns
Gynecology	7	4
Pediatrics	7	2
Radiotherapy	7	1
Surgery	7	4
Urology	5	2
Cardiothoracic Surgery	2	1
Plastic Surgery	3	0
Neurosurgery	6	2
Orthopedic Surgery	4	1
Otolaryngology	7	5
Pediatric Surgery	1	0
Internal Medicine	8	1
Hematology	4	1
Pulmonology	7	3
Gastroenterology	2	0
Infectious diseases	1	0
Endocrinology	1	0
Dermatology	7	5
Neurology	6	2
Psychiatry	4	1
Medical Psychology	1	1
Family Medicine	6	0
Ophthalmonology	7	2
Rehabilitative Medicine	1	0
Reumatology	2	0

2.5 DISCUSSION

The discussion will first encompass the educational resources, followed by a discussion of the activities and attitudes of faculty members concerning some aspects of cancer education.

2.5.1 Educational resources

In all eight medical schools the chairmen of the Curriculum Committees agreed to participate in the interviews. In some schools the chairman had invited one or more oncologists or another faculty member of the Curriculum Committee to participate in the interview.

- *Cancer education environments*

In the period September 1982 – September 1983 medical oncology is represented in all eight medical schools; in three schools with a Division of Medical Oncology, in five schools with a subdivision.*
A Division of Surgical Oncology exists in two schools.
In all eight schools there is a Department or Institute of Radiotherapy.

- *Institutional cancer education characteristics*

The U.S. Cancer Education Survey showed that a Cancer Education Committee and a Cancer Education Program Director or Cancer Education Coordinator** with access to a source of funds specifically for undergraduate cancer education were favorable characteristics to the development of effective student cancer education.
The results of the Dutch study reveal that in 1982-1983 only in two schools a Cancer Education Committee existed, of which only one school had a representative for cancer education on the school's Curriculum Committee.
In none of the schools a Division for Cancer Education existed, nor a separate budget for cancer education, nor a Cancer Education Program Director or Cancer Education Coordinator. That faculty members considered such a Cancer Education Coordinator important was reflected by the fact that in

*In the Netherlands a Division of Oncology is headed by a fulltime specialty oncologist, and has an official status in a Department.
**In the U.S.A. the term Cancer Education Coordinator corresponds to the function of a Cancer Education Program Director.

five of the eight medical schools this task was performed on a voluntary basis by one of the staff members.

- *Structured lectures on cancer topics*

The enumeration of structured lectures on cancer topics does not represent the amount of cancer education in one specialty because of a wide range in number of hours devoted to cancer education in the different medical schools. However, there are a few remarks.
It attracks the attention that in not one of the eight medical schools structured lectures on cancer topics exist for Family Medicine. This does not mean that oncology is left out by faculty members of this discipline; because the question pertains to *structured* lectures on oncology. So, professors of Family Medicine might discuss cancer as part of their lectures. However, as long as family practitioners are especially the persons who see most patients first, it is worth considering whether in lectures on Family Practice there should be recognizable cancer topics, like the importance of cancer prevention, early diagnosis and psychosocial aspects of cancer.
Only in one medical school diagnostic radiology is reported as part of a multidisciplinary lecture course in oncology. From diverse diagnostic radiologists included in the Study, as well as from some radiologists who did not want to participate in the Study, came remarks that they were not involved in cancer education, which they considered a weak point.
Also, it should be recognized that, depending on regional agreements, (in the Netherlands) general physicians have the possibility to refer their patients to the diagnostic radiologist directly. Consequently, all physicians should at least have been taught about interpretation of particular radiology procedures which are relevant to cancer diagnosis.
Also from several neurosurgeons came the remark that they were not, or only to a minor degree, involved in cancer education, which they considered a weak point.

- *Multidisciplinary cancer patient treatment conferences*

The U.S. Cancer Education Survey showed that multidisciplinary cancer patient management conferences were limited in their student education effectiveness, if no interpretive reviews for medical students were available. The Dutch Study revealed that in four of the eight medical schools students were required to attend interdisciplinary treatment planning conferences. In not one school were there structured interpretive reviews for medical students following the conferences.

- *Continuing Cancer Education*

All eight medical schools carry out a program on continuing cancer education, or education on cancer-related topics.
It deserves reflection on the fact that evidently there is a (separate?) budget for postgraduate cancer education. Perhaps medical schools should shift part of their cancer education to an earlier period in medical education, when all future physicians can be taught and when attitudes are more amenable to change.

- *Cancer-related educational programs for nurses and paramedical personnel*

The U.S. Cancer Education Survey showed that active cancer education programs for nurses and paramedical personnel were favorable characteristics to the development of effective medical student cancer education.
Although there is – in the Netherlands – quite a lot of movement with regard to cancer education among specialty nurses, and as radiation technicians are trained in the Departments of Radiotherapy, not one medical school carries out a structured cancer education program for these disciplines. However, it should be recognized that it is not primarily the task of medical schools to carry out such a program. But medical and nursing schools should cooperate in cancer education programs for their students.

- *Anticipated changes in cancer education programs*

When looking at the anticipated changes in the schools' cancer education programs (2.3.8), it is observed that there is activity concerning future cancer education, in some schools to a greater extent than in others.

2.5.2 Faculty members: activities and attitudes concerning cancer education – The Netherlands 1983

In considering the response rates for the F.C.Q. attention should be given to the fact that 74% of all departments to which questionnaires were mailed are represented in the Study. This response rate is considerably higher than that achieved in questionnaire mailings in general. This might reflect the current importance that medical faculty members attach to oncology.

- *Time commitment to cancer teaching*

Consistent with the results in the U.S. Cancer Education Survey, the data in Table 2 (page 44) reveal also in the Netherlands an obvious different amount of cancer teaching efforts by the oncologists in surgical disciplines, in medical oncology and in radiation oncology (group A), compared to other faculty members.
Collectively the gynecologists and the pediatricians in group A devoted less time to cancer teaching than the surgical, medical and radiation oncologists. Concerning the pediatricians this is consistent with the data from the U.S. Survey, concerning the gynecologists it is not. In the U.S. findings the gynecology oncologists devoted as much of their teaching time to cancer education as the other surgical disciplines.
However, in interpreting the findings from the Dutch Study caution should be taken in the interpretation of these two data because of the small number of gynecologists (5) and pediatricians (4) in group A answering the question. Further evaluation of the data revealed for both disciplines a wide range in number of hours devoted to structured cancer education between different faculty members of the different schools. For the U.S. Survey the number of participants for this question was gynecologists: 32 and pediatricians: 33.
The general outline of the data in Table 2 reveal that cancer education in the Netherlands is mainly performed by faculty members who are classified as oncologists according to the (arbitrary) classification in the U.S. Cancer Education Survey (more than 90% of their patients are cancer patients) (group A); and to a less extent by faculty members who are categorized in the Dutch Study as having expertise in oncology, but having less than 90% cancer patients (group B).
This finding is consistent with the U.S. Cancer Education Survey.

- *Expectations concerning own time commitment in the next five years with regard to cancer education and with regard to cancer patient care (1983-1988)*

The figures in Table 5 (page 47) which combine the overall results of the two items presented in the Tables 3 (page 45) and 4 (page 46), reveal that mainly the oncologists in group A expect an increase in their own time commitment to cancer education in the next five years.
The expectations of the other two groups (B and N-O) are predominantly in the direction of an increase in own time commitment to cancer patient care.

• *Attitudes of faculty members toward undergraduate cancer education programs*

Concordant with the U.S. Cancer Education Survey, the attitudes of faculty members toward the undergraduate cancer education programs at their institution were measured in three areas:

1 - The amount of emphasis given to cancer in the curriculum of their medical school (Table 6).
2 - The desirability of a required cancer curriculum for all medical students (Table 8).
3 - The desirability of conducting cancer education by traditional departments or by divisions of oncology (Table 9).

The figures in Table 6 (page 48) reveal that over 50% of 29 oncologists in group A agree with the statement that cancer is given too little emphasis in the curriculum of their medical school. Further analysis revealed that most of these faculty members were the same respondents as the ones who expected their own time commitment in cancer education to increase in the next five years.
Thirty-five percent of the faculty respondents in group A disagreed with the statement, expressing that they were satisfied with the situation.
The faculty respondents in the groups B and N-O shared predominantly the same opinion on this item. Nearly 50% for both groups disagree with the statement that cancer is given too little emphasis in the curriculum of their medical school.
However, it should be realised that the 'disagree'-answers do not give a clear insight in what these respondents exactly disagree with. It may be that they are satisfied with the situation as it is; but the data may also reflect the opinion that cancer is given too much emphasis in their school's curriculum.
In the A group it was fairly sure that the 'disagree'-respondents were satisfied with the situation as it was, because further analysis revealed that 9 of the 10 disagree-respondents were faculty members of schools with a recognizable cancer education program.
In the other two groups (B and N-O) such a relation could not be traced. It should be considered when using these data collection instruments in future studies to more clearly specify this statement, in order to get better information.

The data from Table 8 (page 50) reveal that the majority of the faculty members agree with the statement that a cancer curriculum should be required for all medical students. This reflects the importance that medical faculty members attach to oncology.

In interpreting the figures of Table 9 (page 51) it should be recognized that 17 of 19 'not sure'-respondents made the additional remark that in case of an

oncology unit existing within the regular department, cancer education should be primarily conducted by the oncology unit. This remark allows to categorize these 17 respondents in the group who disagrees with the statement that cancer education should primarily be conducted by a regular academic department, rather than by a division of oncology. This permits to conclude that 60% of all respondents are of opinion that cancer education should be taught by divisions of oncology. Analysis of the 17 'not sure'-respondents revealed that two were categorized in the A group, seven in the B group and eight in the N-O group.
This leaves the conclusion that not only most of the oncologists (79%) tended to believe that cancer education should primarily be conducted by a division of oncology, but this was also the opinion of nearly half (47%) of the Non-Oncologists.

- *Expectations of faculty members concerning change in their school's amount of undergraduate cancer education in the next few years (1983)*

The data in Table 7 (page 49) reveal that faculty members expressing their expectations of the role of their medical school with regard to the amount of cancer education in the next few years (from 1983) are rather uniform for those A, B and N-O respondents who expect the time devoted to cancer education will be kept the same.
Medical oncologists in group A and the radiation oncologists express strongly that they expect their school will increase the time devoted to cancer education.

- *Major cancer-related topics lectured during preclinical years*

Before interpreting the data from Table 10 (page 53), a few remarks should be made.
The question concerning on which cancer topics the faculty members had lectured, was an open-end question. Because a large number of different lecture titles was enumerated, a categorization scheme was developed that consisted of broad categories.
It should be recognized that the lecture topics named may overlap content items. For instance, the categorization scheme includes topics like epidemiology, early diagnosis, metastatic spread, psychosocial aspects, etc. It is possible that respondents, enumerating a specific lecture title, for instance breast cancer, have covered these and other aspects in his/her lecture.
Furthermore, when reading the data in Table 10, the medical

reader is advised to consult Table 1 (page 43) for the specialty groups 'Surgery', 'Internal Medicine' and 'Others', who were categorized by major departmental affiliation.

The U.S. Cancer Education Survey revealed that attitudes of medical students toward oncology are influenced by a variety of factors. Major factors named pertained to experiences with patients and to experiences with faculty members and residents (A.5.4; A.5.5).
Students expressed widespread unattractiveness of cancer patient care. Most frequent mentioned reasons were: 'high mortality rate' (84% of 1757 clinical students) and 'negative experiences with cancer patients' (65% of 1757 clinical students).
Potential consequences of negative student attitudes are discussed in the U.S. Cancer Education Survey (A.5.5.4). One of these consequences is cited here:

> 'Primary care physicians who had not participated actively in cancer education programs in medical schools may never reach their potential skill and interest in diagnosing cancer or in obtaining optimal multidisciplinary oncologic management for their patients through appropriate referral. Furthermore, negative attitudes toward involvement with cancer patients can surreptitiously persist and be incorporated into habits of practicing physicians. The avoidance or abandonment of advanced cancer patients, often subconsciously, may result.'

To the author's opinion the emphasis and the goal of a cancer curriculum should be a definite recognizable entity of the possibilities and attitudes in oncology, with an emphasis on the need and the importance of cancer prevention and early cancer diagnosis by primary health care physicians.
To this background the data of Table 10 will be discussed. This discussion will first pertain more in detail to the three lecture topics which were named most often. Then some specific aspects will be viewed; followed by some general considerations.

Breast cancer was named by 24 faculty members. Analysis of the data revealed that each discipline respondent represented a different medical school. Five major disciplines are involved in teaching about breast cancer. Further analysis disclosed that in some schools breast cancer was a major topic in a multidisciplinary, integrated oncology lecture course in one curriculum year; while in other schools lectures were scattered over different curriculum years.
Five major disciplines are also involved in teaching of *lung cancer.* Analysis of the 11 respondents in the internal medicine discipline showed these were 7 pulmonologists, 3 medical oncologists and one internist. The 7 pulmonologists represented 7 medical schools, the 4 internists represented in their

discipline 4 medical schools, all 4 representing one of the same schools as the pulmonologists.
Surgeons who enumerated lung cancer as a lecture topic were two thoracic surgeons and one general surgeon, all representing a different school.
Of the two physicians in the 'Others' group, one was an epidemiologist, and one a general practitioner, both representing a different school.
Similar to the further analysis of the data on breast cancer, in some schools lung cancer was part of a multidisciplinary integrated lecture course, while in other schools the lectures were scattered over different curriculum years.
Gastrointestinal cancer was named by 22 faculty members, categorized in four main disciplines. Analysis revealed that specialty disciplines were:

- 7 surgeons and 2 otolaryngologists
- 2 gastroenterologists and 5 internists
- 4 pathologists
- 1 epidemiologist and 1 physician in social medicine.

Each faculty member represented a department.
The topics named were:

Cancer of the oesophagus	9 times
Cancer of the stomach	12 times
Cancer of the pancreas	9 times
Cancer of the liver	4 times
Cancer of the biliary tract	5 times
Cancer of the small intestine	1 time
Cancer of the colon	12 times
Cancer of the rectum	2 times

It attracks the attention that cancer of the rectum is only mentioned twice. This does not mean that faculty respondents do not lecture about carcinoma of the rectum. It is quite possible that faculty members, lecturing on colon cancer, do include rectum tumors. Nevertheless, to the students, a lecture announced as colon cancer, there is only minor recognizable identification on cancer of the rectum. Which might surprise, because of all gastrointestinal cancers enumerated, this one in particular is the one that all physicians are able to diagnose to a considerable degree with a very simple measure, just by performing digital examination.
Looking at the list (Table 10) with the different specialty disciplines who lecture on gastrointestinal cancers, the necessity of multidisciplinary teaching is evident.

When looking at Table 10 in general, the multidisciplinary nature of educational resources for diverse topics is evident.
Except for some multidisciplinary integrated cancer education courses in some schools, the presentation of these major topics was mostly given in the traditional departmental teaching.
Because the data document the multidisciplinary nature of teaching clinical

cancer topics, there is a definite need for well organized, coordinated, cancer education activities, in order to reduce needless duplication of efforts and poor utilization of limited curricular time.

In general, there are a few other remarks.

General aspects of cancer is the only clinical topic, enumerated by all faculty respondents. Sound cooperation of such a topic will benefit to a great extent to the understanding of fundamental general aspects of cancer.

The paucity of enumerating clinical lecture entities by *radiation oncologists* might reflect that radiation oncologists are not involved much in structured cancer education. This is consistent with the outcomes from the U.S. Cancer Education Survey. Students in the U.S. Survey reported radiation oncology as the most unattractive discipline in oncology (A.5.4.2), which should be a source of concern. There is still a widespreak lack of appreciation among general physicians of the curative as well as of palliative procedures of radiation oncology. That not one radiation oncologist enumerated skin cancers, only once gynecologic cancer and only twice urologic malignancies, does not contribute to a recognizable entity for medical students of the curative potentials of radiotherapy.

Skin cancers and *cutaneous melanoma* are named by as well surgeons as by the dermatologists, and– as said before – not once by a radiation oncologist. Understanding the management of these tumors should benefit from coordination of education.

Psychosocial aspects were named mainly by faculty members in the group 'Others'. These were:

- one medical psychologist
- one psychiatrist
- four general practitioners
- one physician in social medicine.

There was a remarkable difference in tenor in labeling the lectures. The accent on lecture labeling by one faculty respondent was a positive attitude toward mental support of the 'patient with cancer'. Whereas 3 of the 4 general practitioners labeled the lecture more negatively with: care for the 'dying cancer patient', or care for patients with 'fatal diseases'. One respondent labeled the psychosocial care as 'serious diseases in the family'.

Only 7 of 136 respondents labeled *Metastatic Spread* as a lecture. Next to the 4 surgeons and to one medical oncologist this topic was named by a physician in social medicine and by a dentist. It attracks the attention that not one pathologist labels a lecture 'Metastatic Spread'. This might suggest that pathologists discuss metastatic spread when lecturing on specific topics. However, for the student there is no recognizable identification.

Omissions of important topics are suggested by the paucity of responses listing multidisciplinary aspects (one of the fundamental principles in cancer patient management), early diagnosis, sarcomas and rehabilitation medicine.

In further evaluation of the data in Table 10 another point emerged.
Three of the seven participating faculty members in *Family Medicine* lectured on cancer topics. The three faculty members represented three medical schools.
One faculty member participated in a multidisciplinary oncology course, the other two lectured on cancer topics within their own teaching responsibilities.
One faculty member stated 8 lecture hours in one curriculum year.
One faculty member stated 4 lecture hours in one curriculum year.
One faculty member stated 7 hours scattered over 3 curriculum years.
One of these three faculty members made a remark that oncology was also part of other lectures, scattered over all preclinical curriculum years.
(A fourth faculty member in Family Medicine, representing one of the three medical schools represented by the above-mentioned faculty members, reported two hours of teaching as a practical training course in terminal care for cancer patients.)
Lecture topics named by the 3 faculty members for Family Medicine were:

Lecture topic	mentioned
Seven signals of danger:	1 time
Lumps in the neck:	1 time
Breast cancer:	2 times
Lung cancer:	1 time
Cervix cancer:	1 time
Other malignant diseases:	2 times
Psychosocial care:	2 times
Care for the dying cancer patient:	4 times

It has to be recognized that during the Educational Resources Interviews none of the chairmen of the Curriculum Committees indicated structured lectures on cancer topics in Family Medicine (Section 2.3.4).

Reconsidering Table 10 it can be concluded that the figures document the multidisciplinary teaching character of oncology. The need for a coordinating mechanism emerges, in order to prevent duplication of efforts and undesirable omissions.
When considering Table 10 one of the tasks of a Cancer Education Committee will have to be to coordinate the horizontal lines in the table, and to consider how to reduce the vertical reach of the table.
In these considerations it seems important to emphasize in undergraduate cancer education more the importance of recognizable entities relating to the possibilities and attitudes in oncology.
The emphasis and goal of undergraduate cancer education should be the need, the possibilities and the importance of cancer prevention and early diagnosis by primary health care physicians. Good knowledge of epidemio-

logic aspects, but also of fundamentals of multidisciplinary cancer patient management and psychosocial aspects is indispensable in order to provide optimal care for the patients and their families who may turn for mental support to their family physician during procedures of cancer diagnosis, staging, therapy and follow-up.

- *Structured cancer lectures during clerkships*

The figures in Table 11 reveal that structured lecture courses on oncology during clinical clerkships are provided only by one out of three departments. Most disciplines who provide structured lecture courses for their clinical students are otolaryngology, dermatology, gynecology and surgery. It attracks the attention that structured lectures on oncology are hardly provided by any of the internal departments.
Two respondents made an additional remark that students participated in all multidisciplinary patient management conferences held in the department. Personal investigation by the investigator revealed that no interpretive sessions for students during or after the conferences were provided.

2.6 SUMMARY AND CONCLUSIONS

Some aspects of cancer education in the Dutch Medical Schools were investigated referring to the period September 1982 - September 1983. These aspects pertained to features of institutional environments with regard to cancer education, and to activities and attitudes of the clinicians among the faculty members concerning cancer education.
One hundred and seventy-four faculty members from all eight Dutch medical schools participated in the Study, representing 74% of the clinical departments in the medical schools.
As a basis for the Dutch Study has served data from a nationwide U.S. Cancer Education Survey (1976-1979), in which favorable and unfavorable characteristics to the development of an effective cancer education program are quantified.
Among the characteristics in the U.S. Survey found to be favorable are:

- A multidisciplinary Cancer Education Committee with representation on the School's Curriculum Committee, and with funds specifically designated for undergraduate cancer education
- A Division of Cancer Education, headed by a Cancer Education Program Director or Cancer Education Coordinator.

The Dutch Study revealed that in the period September 1982 - September 1983 there were scarcely any institutional cancer education characteristics

recognizable.

- In two of the eight medical schools existed a Cancer Education Committee, of which only one school had a representative for cancer education in the school's Curriculum Committee.
- A Division for Cancer Education did not exist in any of the eight medical schools.
- In none of the medical schools a Cancer Education Program Director or Cancer Education Coordinator was appointed.
- A separate budget for undergraduate cancer education did not exist in any of the eight medical schools.

The data from as well the U.S. Cancer Education Survey as the Dutch Cancer Education Study document the multidisciplinary nature of teaching clinical cancer topics. The need for a coordinating mechanism emerges in order to prevent duplication of efforts, poor utilization of limited curricular time, and to preclude undesirable omissions. To meet these requirements the task of a Cancer Education Committee will have to be to provide a well organized, coordinated multidisciplinary cancer education program.
In the period September 1982 - September 1983 only some multidisciplinary cancer education programs were recognizable in only a few Dutch medical schools.

The majority of the faculty respondents in the Dutch Study agreed with the statement that a cancer curriculum should be required for all medical students.
Most of the Oncologists tended to believe that cancer education should primarily be conducted by a Division of Oncology; this was also the opinion of nearly half of the Non-Oncologists.

2.7 AUTHOR'S RECOMMENDATIONS*

- A cancer curriculum should be required for all medical students, and in the medical school a Cancer Education Committee should be appointed.

- The Cancer Education Committee should design a multidisciplinary cancer education program which should be implemented by a Division of Cancer Education, headed by a Cancer Education Program Director.

- The emphasis and the goal of a Cancer Curriculum should be a recognizable

*The author's recommendations are based on the combined findings in the U.S. Cancer Education Survey and the Dutch Cancer Education Study.

entity of the possibilities and attitudes in oncology; with an emphasis on the need and the importance of cancer prevention, early cancer diagnosis, and adequate psychosocial care for cancer patients and their families by primary health care physicians.

- Just like Surgical Oncology and Medical Oncology should Radiation Oncology be more clearly recognizable in the cancer curriculum, with an emphasis on therapeutic possibilities and on the management of therapy effects.

- Psychosocial aspects of cancer should get more attention in the cancer curriculum, with an emphasis on the need for adequate psychosocial support for cancer patients and their families during periods of diagnosis, staging, therapy and follow-up. The important role of the family practitioner should be stressed.

- Diagnostic radiology procedures relevant to the diagnosis of malignant diseases with a high incidence should be incorporated in the cancer curriculum.

- Multidisciplinary patient management conferences should have interpretive reviews specifically for medical students. These conferences should be required for all medical students.

- During clinical clerkships more attention should be given to the outpatient clinic and to interpretive cancer lecture courses for the clinical students.

- Medical Schools and Nursing Schools should cooperate in cancer teaching programs for their students.

CHAPTER 3

ASPECTS OF AUDIOVISUAL EDUCATION

3.1 INTRODUCTION

Instructional media in medical education are not yet fully taken advantage of. A complex interaction of circumstances has interfered with a general acceptance of the true merits of audiovisual media as learning aids in medical education. There is – in general – still quite a lot of resistance to introducing instructional audiovisual media as a regular part of a multifaceted medical education system.[24, 27, 33, 34]

In the past three decades great advances have been made in the field of audiovisual media. At the 1977 annual conference of the Institute of Medical and Biological Illustration, Professor J. R. Moore, Dean of the Faculty of Medicine, University of Manchester, discussed that mass media, especially television, have created an enormous audience for cultural and scientific programs of very high standards. The present generation of students has grown up highly exposed to audiovisual media, and are now accustomed to the fact that highly professionally produced documentaries give a large amount of information in a short period of time[42].

Resistance to the introduction of instructional audiovisual media in the medical education system is not found among students, but mainly among the decision-makers, that is the administrators and medical educators.[40, 41, 48, 56] The resistance is often based on lack of familiarity with reliable information on media selection procedures[49].

This chapter will outline a synopsis of the development of instructional audiovisual media in general; of its positive and negative implications on society during its evolution; and of the contemporary authoritative points of view concerning instructional audiovisual media in medical education.

3.2 DEFINITION – MEDIA OF INSTRUCTION

Media of instruction form part of the media of communication, having a very wide range of utilization and application, extending from entertainment through information to instruction. Like print, other media of instruction are not especially designed for instruction. They are media of communication that are used for teaching and learning. Schramm (1981) defines: 'Media of instruction are information-carrying technologies that can be used for instruction'.[49]

3.3 GENERAL OUTLINE OF THE DEVELOPMENT OF INSTRUCTIONAL AUDIOVISUAL MEDIA

The use of instructional audiovisual media has developed since the second decade of this century. Seibert and Ullmer (1982) distinguish three periods of development in educational media use:

- the first period from 1918-1941
- the second period from 1941-late 1950's
- the third period the decade of the 1960's.

Seibert and Ullmer compare these periods symbolically with periods of infancy, childhood and adolescence.[51]

3.3.1 1918-1941

In the first period audiovisual instruction aids were used mainly sporadically by individual educators who were attracted by the medium and who recognized the possibilities for their use. However, because schools and universities were not overcrowded, the full advantages of the medium as a potential learning aid were not generally recognized.
In that period media research was predominantly a case of comparing the learning effects which resulted from the use of one particular medium, with those resulting from conventional face-to-face methods.[2, 49]

3.3.2 1941-late 1950's

A change in this slumbering situation came shortly after the moment that the United States of America became involved in World War II. Army, Navy and Airforce were suddenly faced with enormous training problems, and instructional films brought relief to the situation. Industry soon afterwards met the same problems and instructional films received wide attention. Major media research programs, sponsored and conducted by the military, were initiated.[39, 49]
In the post-war period the interest in instructional audiovisual media continued for a variety of reasons. First of all there were the ongoing media interest and media research programs, still funded by the military. Furthermore, education at all levels of society began to return to normal, but was facing particular post-war problems. College and University enrollments increased steadily, both for daytime and evening courses. Moreover, in the early 1950's a new growing generation came to school, and classes were growing beyond their normal limits. Pressure rose on all levels of education and a wide interest in the instructional learning aids developed; audiovisual media being part of the spectrum.[2, 49, 51]

3.3.3 **Decade of the 1960's**

By this time interest in instructional audiovisual media was being widely gained in diverse sections of society.[49, 51] Funding for ungoing and new media use and research programs was still being generously federally supported, at the time by the U.S. Office of Education because of the interest in new instructional materials. Also industrial companies donated diverse grants, being interested in how television could be used efficiently in training programs.[49]

There was an explosive growth of hardware technology which became available. And soon a definite discrepancy arose between the available instructional hardware and the non-availability of instructional software. Consequently many educators began to produce software themselves. Because of the lack of know-how concerning media design and production technology these 'home-made' productions created an atmosphere of disappointment and contention, when the outcome of expected learning results did not meet the original high expectations.[22, 40, 49]

Communication experts began to realize what was happening and it was recognized that there was no defined technology of media instruction. Extensive reviews and analysis of media studies and of media research literature were started and published.[49, 51] Among the most valuable ones — each review focussing on different aspects of previous media research — were:

- 1963 — a review by Lumsdaine: 'Instruments of media instruction'.[39]
- 1967 — a review by Travers: 'Research and theory related to audiovisual information transmission'.[63]
- 1967 — a review by Briggs, Campeau, Gagné and May: 'Instructional media, a procedure for the design of multi-media instruction, a critical review of research, and suggestions for future research'.[21]
- 1968 — a review by Chu and Schramm: 'Learning from television, what the research says'.[23]

The research subjects of several thousand media studies were (Schramm, 1981):

- Instructional television (largest proportion)
- Programmed instruction and film (next largest)
- Radio (relatively few)
- Simplest media like slides and audiotapes (scarce).

Schramm expresses the conclusion arising from all the reviews:

> 'There is no shortage of research on instructional media, only a shortage of the kind of research that would be most helpful to us.'

This view was even more strongly expressed by Campeau (Briggs et al., 1967)[21]:

'The existing research simply had not asked the right questions.'

Schramm analyzes the 'questions' (1981) and states:

'During the last few decades we have frittered away an enormous amont of research time asking relatively useless questions about the media of instruction.'

Summarizing Schramm's analysis:

- Can the media teach?

  This question has been asked repeatedly; and over and over again the answer has come back: of course, students can learn effectively from the media; they can learn from any medium.

- Can the media teach as well as a teacher?

  The answer: what they can do, they can do as well as a teacher, sometimes better. It depends on the performance of the teacher[66], the content of the media, what is being taught, and to whom.

- Is one medium more effective than others?

  For some purposes, yes, but in general there is no superior medium of instruction, neither as there is a simple algorithm for selecting one medium over others.

- Do students learn more from the big media*?

  There is nothing to indicate any broad and general superiority of the big media.

- Do students learn more from a combination of media than from a single medium?

  Schramm explains: what the question really asks is whether the addition of one or more audiovisual or programmed media will improve instruction, when the time of instruction is held constant. He stresses the importance of the latter qualification. The answer: the research almost invariably indicates that the addition of one or more supplementary or complementary channel of instruction does make a positive difference.

Schramm summarizes:

'If we try to sum up what the experiments tell us, we can do it in relatively few words: students can learn a great deal from any of the media. Under most of the conditions tested, they could learn as much as from face-to-face teaching, about many subjects.'

---

*Big media are for instance film and television. Little media are for instance slides and tape/slide series.

3.3.4 **Since the late 1960's**

The period since the late 1960's shows a steady trend in the acceptance of instructional audiovisual media. Broadly outlined, several events were of importance.[49, 51]

In 1967/68 two instructional media projects were established. Both developed an unexpected international reputation and acceptance. Coincidently they were at the extremes of the educational spectrum: infant class level and university level.

In New York, C.T.W. – Children's Television Workshop – was established which aimed to teach to preschoolers a variety of school-related skills. The series became known as 'Sesame Street' and is still expanding world-wide, both in the English language and in more than twenty other languages.

In England, the British Open University was aimed at adults, especially working adults in need of extending their learning opportunities. The Open University provided fully credible, university-level instruction and degrees.

Both projects, C.T.W. and the British Open University, approached their task through the use of

- curriculum design
- skilled media production teams
- field testing
- continuous evaluation and research procedures.

Much important evidence supporting the media selection, media use and effectiveness of media instruction have resulted from this research.[49, 51]

The success and impact on society of both C.T.W. and the Open University (also successfully established in many other countries in the last decade) has become evident. As demonstrated by Ball and Bogatz in 1970, learners (viewers) can make good educational progress without formal supervision, thus justifying the considerable benefit of this kind of self-instruction with audiovisual aids.[11] At that time, in medical education research, analogous data were published in 1969 in the Lancet by Harden et al.: 'An experiment involving substitution of tape slide programs for lectures'. In this study it was demonstrated that excellent learning occurred with self-instruction audiovisual programs. An additional finding was that foreign students, who did not master the English language well, performed best under these conditions.[36]

These kinds of publications might have strengthened the anxiety emerging among educators who felt socially threatened by the developing instructional media technology. Schramm states that it seems paradoxical that educators, who do not feel threatened by books (which have been completely accepted as learning aids for centuries) do not recognize instructional audiovisual aids are learning aids just like books. Schramm emphasizes:

'The media of instruction ... are extensions of the teacher.'

And he cites Edward L. Thorndike who stated in 1912:

> 'A human being should not be wasted in doing what forty sheets of paper or two phonographs can do. Just because personal teaching is precious and can do what books and apparatus cannot, it should be saved for its peculiar work.'

Dieuzeide[28] in the UNESCO report from 1970: 'Educational Technology and Development of Education' expressed it in this way:

> 'Educational technologies ... free the teacher from certain purely mechanical tasks of exposition and repetition, thus enabling him to devote himself to ... irreplaceable functions of stimulation of interest, diagnosis, motivation and advice.'

Dieuzeide drew attention to the crucial question of whether education should remain the only major human activity in which technology was not supposed to increase man's potential. And he emphasized the 'paradox whereby education is required to change the world without any concession that it itself be transformed.' In this report, which is to be considered as an extensive analysis of educational technology use, it is stated that media use was often too limited in scope and too often used as a stop-gap.

Seibert and Ullmer state in their review 'Media use in education' (1982) that during the seventies, possibly the most important media-related publication to appear was the two-volume report of the President's Commission on Instructional Technology (established under President Johnson).
With S. G. Tickton as editor, volume I was published in 1970 and Volume II in 1971: 'To improve learning: an Evaluation of Instructional Technology'.[57, 58] In a nationwide U.S. Survey it was demonstrated that in all levels of education hardware and software for little media were widely used.
Among the recommendations in the report were:

- a call to establish the National Institutes of Education (N.I.E.) with broad authorization to support educational research, development and application
- a National Institute of Instructional Technology as a unit within the N.I.E., one function of which would be to encourage the production of instructional materials
- emphasis on improved distribution of instructional materials
- improved media technology training for educators
- establishment of working relationships between educators and industry to advance the productive use of technology in education.

In their review Seibert and Ullmer[51] also stress the important impact generated by a publication in 1972 from the Carnegie Commission on Higher Education: 'The Fourth Revolution: Instructional Technology in Higher Education'. This study places communications technology fourth in the succession of educational evolutions, described as four educational revolutions.

I - Master-Apprentice situation.
II - Adoption of the written word as a tool of education.
III - The invention of typography.
IV - The accelerating evolution of communications technology.

In the analysis the continuing shortage of instructional media materials – the software – is noted. The commission lists and discusses 15 recommendations for action, and also presents a series of 'reasonable goals for 1980-2000'.

Some of the recommendations from the Carnegie Commission are that:

- academic disciplines should take action without delay to correct the 'grossly inadequate supply' of good quality instructional materials
- at least seven regional learning technology centers should be established to permit the sharing of costs and facilities among multiple institutions
- federal support for those efforts should rise to a level equaling 1% of total higher education costs
- faculty should receive more recognition and rewards for their efforts to advance the use of instructional technology
- the costs and benefits of available technology should be carefully studied and the findings disseminated to the decision-makers.

Some of the Commission's 1980-2000 goals refer to:

- wide acceptance of a broad definition of instructional technology
- a recommended and major federal report to achieve the development of quality instructional materials
- the development and operation of a system to identify materials and to encourage their development and use.

3.4 DECISION-MAKERS AND MEDIA SELECTION

In the course of the 1970's research tended to change when it became evident that decision-makers needed more factual data and economic information in order to decide on instructional media systems. The priority research topic became media selection, with the intention of providing administrators and decision-makers with sound and practical guidelines for media selection procedures based on instructional effectiveness.[49]

There was a considerable lack of knowledge on media selection, as evidenced among others by Campeau in 1974 in a survey on order by the Council of Europe, and presented in a report: 'Selective review of the results of research on the use of audiovisual media to teach adults'.[22]

Campeau stated that the most impressive aspect of this survey was the finding that instructional media were used extensively, often with enormous amounts of money being invested in very expensive hardware. The study showed that the decisions to purchase the hardware were seldom made on evidence of instructional effectiveness, but were usually based on administrative and oganizational requirements, on considerations of cost and avail-

ability, and also on user preference. This situation was most clearly expressed in the early 1970's by Hawkridge (Director of the Institute of Educational Technology, British Open University) as cited by Schramm (1981):

> '... the University's selections of media are controlled by logistical, financial and internal factors rather than by soundly based and clearly specified psychological and pedagogical considerations.
>
> ... The fact is that instructional researchers and designers have not provided even the foundations for constructing strong procedures for selecting media appropriate to given learning tasks.'

Important research themes became:

- research on economic aspects
- research on the most effective use of instructional media
- research on the content of instructional media.

Until then, cost studies performed were mainly on big media.[49] An extensive media-cost summary was published in 1968: 'Cost Study of Educational Media Systems and their Equipment'. However, the study did not cover the smaller audiovisual instructional media. In fact, there were hardly any cost-effectiveness studies on little media, although it was already demonstrated in 1970 by Tickton et al. in the 'Evaluation of Instructional Technology' reports (1971, 1972) that nationwide in the U.S.A. in all levels of education, hardware and software for little media were widely available and being used in education.[57, 58]

Nevertheless, of the many aspects discussed by Schramm[49] and by Van der Drift[29] there are economic features which are the same for the big media as well as for the little media. They can be summarized as follows.

A planner or an educator needs economic information in order to decide between instructional media systems.

- It is necessary to know both capital and recurrent costs. *Capital costs* are the costs of equipment and facilities that will be in use for longer than the current budget year. *Recurrent costs* encompass salaries, electricity, maintenance, rentals, disposable items, and other such goods and services that depend upon the needs in a given year.
- But estimating costs is only one step in the planning. It is also necessary to analyze cost-effectiveness and cost-benefits. *Cost-effectiveness analyses* give short-term answers, like research results on learning effectiveness. However, education is also designed to serve long-range social and economic needs: *cost-benefit analyses* are based on an estimation of long-term results.

Other important items to consider are:

- *The number of users a planner wants to reach.*

Cost studies are expressed in costs per student-hour. The main questions are:

1 - In a given situation which medium is more cost-effective than another?

2 - How can a given medium best be used for a given instruction?

The costs of an instructional audiovisual program are justifiable when used by many people in a clearly defined period of time. For instance: it is not justifiable to produce an expensive high-quality instructional audiovisual program for a once-a-year lecture showing. In that case a set of slides will have to do. However, it is justifiable to produce a high-quality instructional audiovisual program when it is to be used frequently in different curriculum years and on diverse other occasions, consequently reaching many students.[40, 49, 59]

- *The level of quality to be required of the media teaching materials.* In other words: how professional the product (software) will have to be.
- *Production costs* are mainly dependent on
  - the number of people in the production team
  - the information carrier
  - the technical facilities.

Two other important questions to consider are:

- How much will it cost *to expand* the system in future, if necessary?
- How much will it cost *to abandon* the system and change to something else, for example after a couple of years?

3.5 CONTEMPORARY INSTRUCTIONAL MEDICAL MEDIA TECHNOLOGY

In the 1960's no professional training programs existed for medical audiovisual education technologies. In the 1970's the situation gradually changed. Training programs for instructional medical media technology were established, mainly in North America, Great Britain and the British Commonwealth.

In 1981 an important compilation was published of a joint project between the U.S. National Library of Medicine and the Association of American Medical Colleges, in which general criteria for the quality of Instructional Audiovisual Materials for Health Professionals were defined and set out.[54] Participants in the project were producers, educators and users of audiovisual materials, all of them being staff members of various medical schools, learning resources centers and audiovisual centers from all over the U.S.A. In addition there were representatives from diverse medical associations. Guidelines were set out on:

- content
- instructional design
- technical production
- packaging.

In the same year, aspects of a curriculum on Health Sciences Information Skills and Media Management in Medical Illustration were discussed by Spencer and Stenstrom.[53]
Nonetheless, the evolution of these training programs for Health Sciences Communications is still a rather slow process. Well defined training programs and curricula are still scarce and with the economic recession of the last decade the audiovisual departments of many medical schools – all over the world – have difficulty in surviving.[49, 51]

3.6 SUMMARY AND CONCLUSIONS

The last three decades have shown a steady trend in the recognition of instructional audiovisual media in general. A defined technology of media instruction has been developed since the late 1960's.
A report of the President's Commission on Instructional Technology and a report of the Carnegie Commission on Higher Education have both contributed – early 1970's – to the acceptance of Instructional Media Technology. Both reports pertain among other things to the importance of a media technology training; and to the development, production and distribution of instructional materials. Also, in the Carnegie report reasonable goals are set out for 1980-2000, among which are a recommendation for a recommending and major federal report to achieve the development of quality instructional materials; and a recommendation for the development and operation of a system to identify quality materials and to encourage their development and use.
The first training programs for instructional medical media technology have been established in the early 1970's. In 1981 general criteria for the quality of instructional audiovisual materials for health professionals were defined and set out in a joint project between the U.S. National Library of Medicine and the Association of American Medical Colleges. Guidelines on instructional medical audiovisual materials were outlined on content, instructional design, technical production and on packaging.

- Education is designed to serve long-range social needs.
- The costs of instructional audiovisual programs are justifiable when they are used by many people in a clearly defined period of time.
- Media selection should primarily be assigned to given learning tasks.
- Students learn more from a combination of instructional stimuli.

- Students can learn from instructional audiovisual materials, just like they can learn from books.

- Professionally produced audiovisual (medical) education materials free the (medical) teacher from diverse duplications of effort.

CHAPTER 4

A STUDY ON THE AVAILABILITY AND USE OF AUDIOVISUAL CANCER EDUCATION MATERIALS IN THE NETHERLANDS – 1983

4.1 INTRODUCTION

In the U.S. Cancer Education Survey the data revealed utilization of a wide range of audiovisual aids in cancer teaching. However, only a minority of the diverse medical disciplines indicated such usage. In the U.S. Survey this was interpreted as a possible reflection of a need for the development of more and better audiovisual materials and a potential for much wider application (A.4.1.5)

In two open questions in the U.S. Cancer Education Survey it was found that a considerable percentage of the cancer education faculty members expressed a desire for new cancer teaching materials, consisting of programmed texts, slides, tape/slide series and videotapes, especially in the content areas of diagnosis and treatment, cellular biology, and chemotherapy.

Because the Dutch National Cancer Education Project has been established to produce audiovisual cancer education materials as supplemental resources in cancer education, it was considered of interest to investigate in the Dutch Cancer Education Study (Chapter 2) the two above-mentioned open questions, supplemented with some more detailed questions concerning the availability and usage of audiovisual cancer education materials in the Netherlands.

For the study design of the Dutch Cancer Education Study, the response rates, the characteristics of the medical faculty respondents and their categorization by major departmental affiliation, the reader is referred to Chapter 2. In this chapter only the content of the data collection instruments concerning audiovisual aids in cancer education is presented.

4.2 DATA COLLECTION INSTRUMENTS

In the Dutch Cancer Education Faculty and Curriculum Questionnaire (Section 2.2.3.4) the questions 8-14 pertained to audiovisual materials.

8 – In your teaching about cancer, do you use any audiovisual techniques of teaching? Yes / No
If no, why not?
If yes, which of the following do you use, and how often?
Frequently or occasionally: slides / tape-slide series / video-

tapes / films / live closed TV circuit

9 - Does your medical school provide audiovisual library facilities? Yes / No / Don't know

10 - Are there facilities in your own department where students can use audiovisual learning aids for self-instruction? Yes / No
If no, why not?
If yes, what hardware is available?
a - Hardware for tape/slide series.
b - Hardware for videotapes.

11 - Do you own audiovisual cancer education programs?
Yes / No. If yes, how did you acquire these materials?
a - As a presentation copy.
b - Purchased on own initiative.
c - Purchased on recommendation.
d - Purchased or received from an agent of a pharmaceutical industry.
e - Self-produced.

12 - Have you ever been involved in the production of an audiovisual cancer education program? Yes / No
If yes:
a - Was the production aimed for use in your own department? Yes / No
b - Were copies produced for application in other hospitals? Yes / No

13 - In general, are you satisfied with the medical content and the technical quality of the available audiovisual cancer education programs? Yes / No
On which program(s) do you base your answer?
Program(s) _____ Produced by _____

14 - What improvements would you like to see in the instructional audiovisual programs which are at your disposal in cancer education?

The questions 8 and 14 are consistent with the tenor of the questions from the U.S. Cancer Education Survey.
The questions 9-13 are supplemental in the Dutch Cancer Education Study.*

*The Dutch version of the questions 8-14 is presented in Appendix B.

4.3 RESULTS

4.3.1 Use of audiovisual techniques for teaching about cancer

Faculty members were asked about their use of audiovisual techniques in cancer teaching.

Question: 'In your teaching about cancer, do you use any audiovisual techniques of teaching?' Yes / No
If no, why not?
If yes, which of the following do you use, and how often?
Frequently or occasionally: slides / tape-slide series / videotapes / films / closed TV circuit

The topic was evaluated for 147 (84%) from the 174 participating faculty members in the Study. One hundred and thirty-three from these 147 respondents (90%) did use audiovisual techniques in their cancer teaching. The results are presented in Table 12.

TABLE 12.
DISTRIBUTION OF AUDIOVISUAL TECHNIQUES USED BY 147 FACULTY MEMBERS IN CANCER TEACHING (1983).

Respondents (147)	Frequently*	Occasionally*	None
Slides	87%	7%	
Tape/slide series	17%	23%	
Videotapes	15%	23%	
Films	4%	18%	
Closed TV circuit	1%	17%	
None			10%

*Percentages do not sum to 100%.

Fourteen respondents (10%) did not use any audiovisual techniques in their teaching. The reason was predominantly lack of finances to purchase hardware and software. Two respondents expressed that using audiovisual techniques would result in less personal communication between students, educators and patients.

4.3.2 **Audiovisual library facilities in the medical school**

In the period September 1982 - September 1983 in five of the eight medical schools there was an audiovisual library provided by the school. In one of the remaining medical schools the audiovisual library was in progress, and in two schools planning was contemplated.

Because it is a general observation that faculty members in medical schools are not always aware of the audiovisual library facilities in their school, it was decided to include a question on that item, investigating the value of the observation.
Faculty members were asked concerning central audiovisual library facilities in their medical school.

Question: 'Does your medical school provide audiovisual library facilities?' Yes / No / Don't know

The topic was evaluated for 157 (90%) from the 174 participating faculty members in the Study. It was verified concurrently whether the answers were correct or not. The results with the additional verification are presented in Table 13.

TABLE 13.
AWARENESS OF 157 FACULTY MEMBERS OF AVAILABLE AUDIOVISUAL LIBRARY FACILITIES PROVIDED BY THEIR MEDICAL SCHOOL; SUPPLEMENTED WITH ADDITIONAL VERIFICATION ON CORRECT ANSWERS (SEPTEMBER 1982 - SEPTEMBER 1983).

Respondents (157)		False Yes	False No
Yes	59%	13%	
No	16%		3%
Don't know	23%		
In progress	2%		

4.3.3 **Audiovisual facilities in departments**

Faculty members were asked about the availability of audiovisual facilities in their own department for self-instructional use by students.

Question: 'Are there facilities in your own department where students can use audiovisual learning aids for self-instruction?' Yes / No
If no, why not?
If yes, what hardware is available?
a - Hardware for tape/slide series.
b - Hardware for videotapes.

The topic was evaluated for 164 (94%) of the 174 participating faculty members representing 139 (99%) of the 141 clinical departments included in the Study. The results are presented in Table 14.

TABLE 14.
AUDIOVISUAL LIBRARY FACILITIES IN 139 CLINICAL DEPARTMENTS (1983).

Departments (139)	No hardware facilities	Hardware facilities	Tape/slide recorders	Video recorders	Don't know
Surgery	15	18	18	13	-
Internal Medicine	8	9	8	4	2
Radiology	7	7	7	4	-
Gynecology	1	6	4	6	-
Pediatrics	2	5	5	4	-
Pathology	3	4	4	2	-
Others	12	42	31	26	-
Number departments	48	91	77	59	-
%* departments	35%	65%	55%	42%	

*Figures do not sum to 100%.

Sixty-three faculty members representing the 48 departments where no audiovisual facilities in the own department were available named as main reason for the non-availability:

Existence of central audiovisual library	21%
Economic reasons	12%
Lack of room	11%
Miscellaneous	35%
No reason named	21%

4.3.4 **The possession of audiovisual cancer education programs**

Faculty members were asked whether they possessed audiovisual cancer education programs, and if so, in which manner they acquired these programs.

Question: 'Do you own audiovisual cancer education programs?' Yes / No. If yes, how did you acquire these materials?

a - As a presentation copy.
b - Purchased on own initiative.
c - Purchased on recommendation.
d - Purchased or received from an agent of a pharmaceutical industry.
e - Self-produced.

The topic was evaluated for 165 (95%) of the 174 participating faculty members in the Study. The results are presented in Table 15.

TABLE 15.
POSSESSION OF AUDIOVISUAL CANCER EDUCATION PROGRAMS AND MANNER OF ACQUIREMENT (1983).

Respondents (165)	Possession of AV cancer programs: NO	Possession of AV cancer programs: YES	Presentation copies	Purchased on own initiative	Purchased on recommendation	From pharmaceutical industry	Self-produced
Surgery	23	16	9	9	6	3	9
Internal Medicine	22	8	4	4	-	1	2
Radiology	8	6	-	2	2	-	4
Gynecology	2	5	1	-	1	1	1
Pediatrics	6	2	1	1	-	-	-
Pathology	2	6	2	3	-	-	4
Others	39	20	5	8	4	2	13
	102	63	22	27	13	7	33
%* yes-respondents			35%	43%	21%	11%	52%

*Figures do not sum to 100%, because faculty members can have diverse programs, acquired from diverse sources.

4.3.5 **Personal faculty member involvement in the production of audiovisual cancer education programs**

Faculty members were asked whether they ever had been involved in the production of an audiovisual cancer education program. At the same time it was analyzed whether these were 'home-productions' or whether copies were also produced for application outside the own clinical environment.

Question: 'Have you ever been involved in the production of an audiovisual cancer education program?' Yes / No

If yes:

a - Was the production aimed for use in your own department? Yes / No

b - Were copies produced for application in other hospitals? Yes / No

The topic was evaluated for 167 (96%) of the 174 participating faculty members in the Study. The results are presented in Table 16.

TABLE 16.
PERSONAL INVOLVEMENT OF FACULTY MEMBERS IN THE PRODUCTION OF AUDIOVISUAL CANCER EDUCATION PROGRAMS.

Respondents (167)	Involved in production: NO	Involved in production: YES	For use in own department	Copies for other hospitals
Surgery	22	18	15	12
Internal Medicine	18	13	8	6
Radiology	4	10	6	7
Gynecology	4	3	3	2
Pediatrics	8	-	-	-
Pathology	3	5	4	4
Others	49	10	7	5
	108	59	43	36
%* yes-respondents			73%	61%

*Figures do not sum to 100%, because faculty members could have been involved in different productions.

4.3.6 **Opinion of faculty members concerning the quality of audiovisual cancer education programs (1983)**

Faculty members were asked about their opinion of available audiovisual cancer education programs. Part of the question was on which program or programs the opinion was based.

Question: 'In general, are you satisfied with the medical content and the technical quality of the available audiovisual cancer education programs?' Yes / No
On which program(s) do you base your answer?
Program(s) _____ Produced by _____

The topic was evaluated for 53 (30%) of the 174 participating faculty members in the Study. The question on which program(s) the answer was based on, was an open question. In the answers a trend on release sources emerged. This was the reason to employ a scheme which distinguished three categories of release sources: the Dutch National Cancer Education Project (DNCEP), own productions, and other release sources. These were: American Cancer Society, American College of Physicians, American Society of Hematology, IPALS, Stichting Film en Wetenschap, Erasmus Universiteit, Rotterdam, Werktheater. The results are presented in Table 17.

TABLE 17.
SATISFACTION OR DISSATISFACTION WITH MEDICAL CONTENT AND TECHNICAL QUALITY OF AVAILABLE AUDIOVISUAL CANCER EDUCATION PROGRAMS (1983).

Respondents (53)	Satisfied	NOT satisfied	DNCEP: POS.	DNCEP: NEG.	Own production: POS.	Own production: NEG.	Other: POS.	Other: NEG.
Surgery	17	2	12	-	2	-	3	-
Internal Medicine	8	1	3	1	-	-	2	-
Radiology	3	1	3	1	1	-	-	-
Gynecology	1	2	1	1	1	1	1	-
Pediatrics	1	1	1	-	-	-	-	-
Pathology	5	-	4	-	1	-	1	-
Others	8	3	3	-	2	-	3	-
	43	10	27	3	7	1	10	-
	81%	19%						

4.3.7 **Improvements desired by faculty members in audiovisual cancer education materials (1983)**

Faculty members were asked what improvements they would like to see in audiovisual cancer education materials.

Question: 'What improvements would you like to see in the instructional audiovisual programs which are at your disposal in cancer education?'

The question was responded by 62 (36%) from the 174 participating faculty members in the Study. From the diversity of items expressed by faculty members in response to the open-end question, a scheme is employed which categorized faculty responses into one of two major categories: 'medical content' and 'availability and use'. The results are presented in Table 18.

TABLE 18.
IMPROVEMENTS DESIRED BY FACULTY MEMBERS CONCERNING AUDIOVISUAL CANCER EDUCATION PROGRAMS (1983).

(DNCEP = Dutch National Cancer Education Project)

Faculty respondents (62)	Number of responses	%*
Medical content		
• More programs aimed at clinical oncology	33	53%
• More programs aimed at psychosocial aspects	5	8%
Availability and use		
• More information on availability of audiovisual cancer education programs	18	29%
• More programs produced by the DNCEP	9	15%
• Satisfied with what is available	2	3%
• Financial restraints or lack of space	7	11%
• Disagreement with the use of audiovisual learning aids	4	6%
• Miscellaneous	9	15%

*Percentages do not sum down to 100%; several faculty members gave two or more answers.

4.4 DISCUSSION

The data in Table 12 (page 82) reveal that audiovisual learning aids are used widely in cancer education. It should be realized that 'slides' exclusively are not part of 'audiovisual' learning aids, but in fact are visual learning aids. However, as stated by Schramm in 1981, an educator demonstrating visuals during a lecture is to be considered performing an audiovisual presentation. Apart from this fact the data in Table 12 reveal an evident difference in the reported extent of use of slides and of structured cancer education audiovisual programs. These data might reflect several possibilities:

- unavailability of hardware
- unavailability of software
- disinterest by faculty members concerning the use of audiovisual (cancer) education materials.

To get an impression on the different aspects which might contribute to the use or non-use of audiovisual cancer education materials some more detailed media questions were added in the Dutch Study. These referred to:

- the availability of hardware (central audiovisual library or facilities in distinct departments)
- the possession of instructional materials by faculty members
- the interest of faculty members concerning audiovisual cancer education materials:
  - possession of audiovisual cancer education programs
  - involvement in production
  - wishes on improvements in audiovisual cancer education materials.

As stated in Section 4.3.2 a particular observation is that faculty members in medical schools are not always aware of the audiovisual library facilities in their own medical school. The data in Table 13 (page 83) reveal that not only did 23% of the respondents not know, but also that in the group of the yes-responders 13% answered false positive; and in the group of the no-responders this percentage was 3.
Together, the outcome of this question presents the following observation:
61% of 157 faculty members were well informed concerning central audiovisual library facilities in their school
39% of 157 faculty members were not.
Some caution should be taken in interpreting these figures. With 13% false positive responses it is not certain whether all the positive responses were really good answers. However, the figure of 23% 'Don't know'-responders demonstrates the reality of the observation that faculty members in medical schools are not always aware of the existence or non-existence of audiovisual library facilities in their medical school.

The figures in Table 14 (page 84) reveal that in 48 (35%) of 139 individual

departments there were no audiovisual display facilities for self-instructional use by medical students. In the 65% of the departments where audiovisual facilities were available there was a slight predominance (in 1983) toward facilities for tape/slide series over those for videocassettes.

The data in Table 15 (page 85) reveal that 38% (63) of 165 respondents possessed audiovisual cancer education programs, most of which were purchased, either on their own initiative or on recommendation. Half of the 63 owners of audiovisual cancer education programs used home-made materials, and 22 mentioned non-commercial presentation copies. Further analysis of the latter data revealed that 18 of these 22 owners of presentation copies had been co-author of one of the audiovisual programs of the Dutch National Cancer Education Project.
A minority of faculty members mentioned they had received or purchased an audiovisual cancer education program from a pharmaceutical industry.

The data in Table 16 (page 86) reveal that 59 (35%) of 167 respondents had ever participated in the production of an audiovisual cancer education program. From these 59 faculty members 43 (73%) had been involved in the production of a program for use in their own department; 36 (61%) had been involved in the production of an instructional audiovisual that also had been distributed to other hospitals. Further analysis of the data revealed that 27 of the latter respondents had been co-author in one of the productions of the Dutch National Cancer Education Project.

In contrast to all the other questions in the Dutch Faculty and Curriculum Questionnaire (14 items, 7 on structure and attitudes concerning cancer education, and 7 items on audiovisual aids in cancer education), the last two questions – concerning structured cancer education audiovisuals – were answered by a minority (approximately one third) of the 174 participating faculty members. Response rates to the other questions varied between 111 and 167 respondents with a mean of 87% respondents.
The question concerning satisfaction or dissatisfaction with the medical content and technical quality of the audiovisual cancer education programs in 1983 (Table 17, page 87), was answered by 53 (30%) of the 174 participating faculty members in the Study. The data reveal that 81% of these 53 respondents were satisfied with the quality of the audiovisuals. The responses to this open-end question disclosed that most of the programs mentioned were productions of the Dutch National Cancer Education Project. From the other release sources named, eight were in-house productions and ten were from seven different release sources, of which four were from abroad.
These data give support to the supposition that structured cancer education audiovisuals are not widely available.

The question concerning suggested improvements in audiovisual cancer education programs (Table 18, page 88) was also answered by a minority: 62 (36%) from the 174 faculty members participating in the Study.
Fifty-three percent of these 62 respondents asked for more programs aimed at clinical oncology topics, and 8% expressed primarily a desire for more programs on psychosocial aspects of cancer.
Twenty-nine percent of the 62 respondents asked for more information on the availability of audiovisual cancer education programs, and 15% expressed the desire for more programs produced by the Dutch National Cancer Education Project (1983).
These data seem to reflect a need for the development of more instructional oncology audiovisuals and a potential for wider application. This is in accordance to the findings in the U.S. Cancer Education Survey.

4.5 SUMMARY AND CONCLUSIONS

In accordance with the data in the U.S. Cancer Education Survey (1976-1979) data from the Dutch Cancer Education Study show the usage of a wide range of audiovisual materials in cancer teaching.

Approximately 40% of the faculty members responding were not well informed or aware of audiovisual library facilities in their medical school.

In about two thirds of clinical departments audiovisual hardware was available, with a slight predominance (in 1983) toward tape/slide recorders over videoplayers.

Half of 63 cancer education software owners used home-made materials, and one third possessed non-commercial presentation copies.

A quarter of the participating faculty members had been involved in the production of an audiovisual cancer education program for use in the own department, and one fifth had been involved in the production of instructional audiovisuals that were also distributed to other hospitals.

The data revealed that most of the instructional audiovisuals recognized by faculty respondents especially for cancer education were produced by the Dutch National Cancer Education Project.

The data give support to one of the suppositions in the U.S. Cancer Education Survey that there is a need for the development of more instructional oncology audiovisuals and a potential for wider application.

CHAPTER 5

THE DUTCH NATIONAL CANCER EDUCATION PROJECT

5.1 AIMS

The Dutch National Cancer Education Project is a nationwide project, financed by the Netherlands Queen Wilhelmina Cancer Foundation. The Project is established to produce audiovisual cancer education programs as supplemental resources for cancer education.
The commission of the Dutch National Cancer Education Project is:

> To produce audiovisual learning aids as supplemental resources in undergraduate cancer education, in a way that will preclude unnecessary duplication of efforts and prevent undesirable omissions.

After an initial try-out stage in which a number of programs were produced on surgical oncology*, it soon became apparant that an organizational design had to be created with the following requirements (Oldhoff, 1981).[45]

1 - The medical input should be multidisciplinary and the knowledge should be harvested from all involved disciplines.
2 - Cooperation should be obtained of co-authors with expertise in particular topics from diverse hospitals throughout the Netherlands, in order to ensure expert program content and involvement of all medical schools.
3 - A small production team, consisting of a triumvirate representing 'audiovisual', 'cancer' and 'education', should have authorized responsibility for the production of professional instructional audiovisual programs.

It also became apparent that the instructional programs would have to meet the following requirements concerning the manner in which the programs were intended to be used.

a - *Self-instruction* — in the framework of a multifaceted medical education system, providing the opportunity to acquire in a short period of time (approximately half an hour) multidisciplinary basic oncology knowledge about a particular oncologic item.
b - As an *aid to lecturers*, like surgeons, radiotherapists, internists, pathologists etc., who would then be able to develop their lec-

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*A first Project (1976-1979) was supervised by Prof. Dr. A. Zwaveling (Leiden) and Prof. Dr. J. Oldhoff (Groningen).[44]

tures as an expansion upon the basic multidisciplinary knowledge of a particular malignant disease already learned from a self-instructional audiovisual program, thus precluding unnecessary duplication of efforts.

To the author's knowledge the organization of a medical multidisciplinary and multi-institutional instructional audiovisual program has not been described before. In 1982, Battles et al.[13], from Ohio, published their experiences and organization with regard to a multidisciplinary and multi-institutional approach to instructional materials. However, the Ohio approach pertains to instructional packages mainly composed of written materials, so-called modules, audiovisual aids being part of the compound structure. The distinct audiovisual materials are produced in the conventional manner with the participation of only one medical specialist.
This chapter will outline the organizational design of the Dutch National Cancer Education Project concerning the production of audiovisual cancer education programs, realized by a multidisciplinary and multi-institutional approach, as performed since 1983.

5.2 ORGANIZATION

5.2.1 Administrative organization (1984)

The organizational administrative structure of the Dutch National Cancer Education Project is presented in Fig. 2.

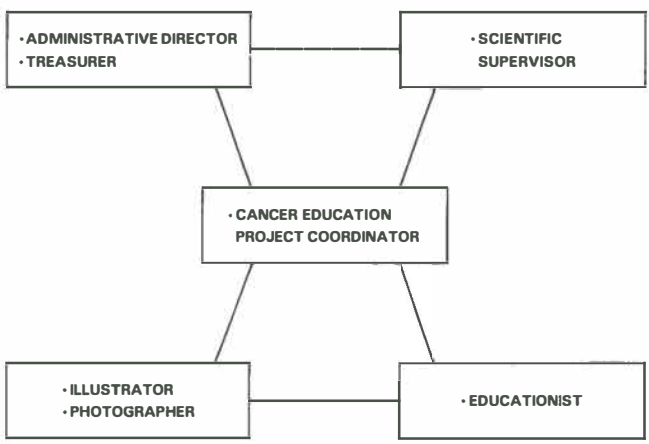

Fig. 2. Administrative organization of the Dutch National Cancer Education Project (1984).

5.2.2 **Production design organization (1984)**

The organizational production design of the Dutch National Cancer Education Project (1984) is presented in Fig. 3.

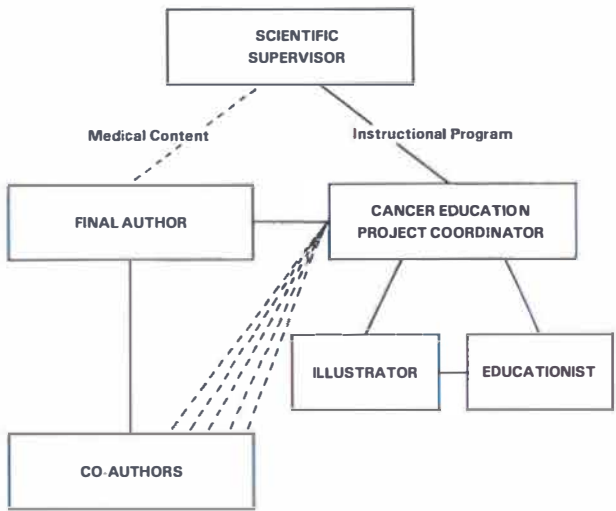

Fig. 3. Production design organization of the Dutch National Cancer Education Project (1984).

In the production design there is a definite disjunction between the two responsibilities in the construction of the audiovisual program. The final author is responsible for the medical content, and the cancer education project coordinator for the instructional program. The scientific supervisor guides every program, but delegates the execution to the project coordinator, who in turn has to report back to the scientific supervisor in matters concerning the production activities.

In the following review two outlines will be discussed.

1 - One year production planning.
2 - The production of an individual program.

5.2.3 **One year production planning**

After the Netherlands Cancer Foundation had given a prolonged three-year grant for 12 audiovisual cancer education topics per 1984, the planning per

year — running from January up to and including December — started in September of the preceding production year. Four cancer topics per year will be produced.
For each year four final authors are invited to take the responsibility of the medical content of a program. These authors are chosen by the scientific supervisor and the project coordinator.
Then four steps are taken.

1 - Written invitations are sent out to all four final authors.
2 - First general meeting. Main purpose: information.
3 - Individual program content planning.
4 - Second general meeting. Main purpose: decision-making.

These points will be discussed.

5.2.3.1 *Invitations to final authors*

The invitations to the four final authors are in the first instance by letter, in order to allow the recipients to think over the nature of the invitation. Some relevant data concerning the Project are included in the letter: goal, organizational structure, and product information in the form of a macrofiche representing some images of a completed program together with the accessory booklet containing the narrated text of that particular instructional program.

5.2.3.2 *The first general meeting*

The first general meeting is mainly informative in nature, to further social acquaintances and to give more detailed information about the Project.
The meeting is attended by the four invited final authors, the scientific supervisor and the production staff, consisting of the cancer education project coordinator, the illustrator, the educationist and the secretary. The meeting is presided over by the scientific supervisor.

The agenda consists of four items.

1 - *Information* about the aims of the Project (Section 5.1), given by the scientific supervisor.
2 - Information on the *working procedures* with reference to the medical content, co-authors, and the audiovisual production procedures; given by the project coordinator. There is also discussion of where the responsibilities lie concerning the medical content and audiovisual production.
3 - Information on *evaluation studies* of productions of the Project and *study results* are discussed by the educationist.

4 - Discussion and arrangements of individual program content planning and concerning the second general meeting conclude this conference.

5.2.3.3 *Individual program content planning*

A draft content planning is broadly outlined by each final author and the cancer education project coordinator. The final author discusses what he/she wants to teach. The coordinator, prepared for this meeting with general knowledge on the topic, direct questions concerning the main message and goal of the program together with prospective target groups (Chapter 6). The ideas of the final author are noted down.
Furthermore, a tentative choice of co-authors is discussed. Co-authors are selected on the basis of the following considerations:

- Expertise in content matter
- Different disciplines
- Regional distribution throughout the Netherlands.

Co-authors are not exclusively oncologists. A general practitioner and a specialist (both known to be interested in oncology) are asked to participate as well. Their main task is to see that the program definitely meets the requirements of the primary health care physician. In addition, an anatomist participates, taking care that the nomenclature meets contemporary regulations as advised by the International Nomenclature Committee.

5.2.3.4 *The second general meeting*

Before the second meeting (in December) the project coordinator sends to the scientific supervisor, to the four final authors, to the educationist and the medical illustrator:

- An agenda for the meeting
- An outline of the activity planning for the forthcoming production year
- The draft content plannings of the four topics
- A review of all proposed co-authors for the four programs.

In the second general meeting, presided over by the scientific supervisor, resolutions are adopted.

- The individual content plannings are discussed and, if necessary, alterations are accepted.
- The production possibilities, especially in relation to time commitment, are considered.
- The review of the proposed co-authors is passed.
- The production sequence of the various programs is agreed upon.

5.2.4 **Individual program production**

In the production process, as performed by the Dutch National Cancer Education Project, five landmarks can be identified.

1 - Invitations to co-authors.
2 - The pre-production meeting — main purpose:
    a - information
    b - decision-making.
3 - The production of a try-out audiovisual program.
4 - The storyboard meeting.
5 - The audiovisual production of the definitive cancer education program.

These items will be discussed.

5.2.4.1 *Invitations to co-authors*

Preparations for an individual program start two to three months ahead. The same procedure is followed as for inviting the final authors. Invitations are in the first instance by letter, to allow the recipient to think over the nature of the invitation. Some relevant data concerning the Project are included in the letter. These are:

- Goal
- Organizational structure
- Product information in the form of a macrofiche representing some images of a completed program, together with the accessory booklet containing the narrated text of that particular instructional program
- The topic of the proposed program
- The name of the final author
- A list of all invited co-authors
- The time commitment for the co-authors
- Copyright information. (Copyright of the instructional programs remains with the Netherlands Queen Wilhelmina Cancer Foundation.)

Since 1980 fifteen programs, produced by this multidisciplinary and multi-institutional approach, have been completed. Some of these are single units, others are multipartite series. Up until the end of 1984, 14 final authors and 91 different co-authors have been invited to participate in this national cancer education project. Only once did a final author not accept the invitation — because he was about to retire — and then he proposed his younger successor in his place. Only twice did a co-author refuse to participate. One did so because of time constraints and the other because he did not agree with the proposed content design of the audiovisual production.

5.2.4.2 *The pre-production meeting*

In the first general meeting — a three-hour afternoon session — two objectives are pursued:

1 - that the different participants get to know each other,
2 - that resolutions are passed on content specification.

The meeting is attended by the scientific supervisor, the final author, all co-authors, and the production staff.
In preparation for the first meeting every participant receives an agenda and a more elaborated draft content planning, still in broad outlines.
The meeting is presided over by the project coordinator.
The agenda consists of 6 items:

1 - General information on the Project is introduced by the scientific supervisor.
2 - Information on the production procedures is presented by the project coodinator. This topic is divided into two main items: medical content and audiovisual production.
Participants receive a scheme of the production design organization (Fig. 3, page 94). The responsibilities of the final author (medical content) and the project coordinator (instructional audiovisual program) are outlined.
Another scheme, with reference to the production procedures and the assignment of duties and responsibilities of the distinct project staff members in the audiovisual production line is talked over in order to give an impression of the many steps to be taken in the construction of an instructional audiovisual program (Fig. 4).
3 - Questions are invited on the above-mentioned general information before going into the merits of the content specification.
4 - Discussion on the draft content follows. The content specification is still kept in broad outlines during the first meeting. The reason for this will be discussed in the following section referring to the production of a try-out program. However, a consensus is pursued on the general medical content topics. This is not as difficult as it seems, because the main content of most programs is basic clinical information on a particular oncologic topic, and emphasis on early diagnosis. The audiovisuals do not go into detailed merits of therapy, but only outline general management concepts.
5 - A date for a second meeting (the 'storyboard meeting') 10-12 weeks later is fixed.
6 - After questions are invited and dicussed, the meeting is closed.

PROGRAM: _____ Date: _____

Fa	Ss	Ed	Co	Se	Il	Ph	
x			x				INDIVIDUAL PROGRAM CONTENT PLANNING
x	x	x	x		x		Discussion content proposals
			x	x			Processing draft content planning
				x			Draft sent to co-authors
				x			Draft returned from co-authors
			x	x			Processing opinions from co-authors
x	x	x	x	x	x		PREPRODUCTION MEETING
			x	x			Processing data preproduction meeting
					x		Designing storyboard
		x	x		x		Storyboarding by production team
			x	x			Designing manuscript
					x		Planning working procedure
					x		Artwork
					x	x	Recording clinical visuals
					x	x	Recording pathology visuals
					x	x	Recording X-ray visuals
					x	x	On-location recording
			x	x	x	x	Recording text visuals
x			x				Draft manuscript and visuals discussed with final author
			x	x			Processing data
		x	x				Draft manuscript discussed with educationist
			x	x			Processing data
x							Corrections manuscript by final author
			x	x			Processing data
					x	x	Recording of try-out program
			x				Preparing draft narration
			x				Recording draft narration
			x	x	x		Preparing storyboard meeting
x	x	x	x	x	x		STORYBOARD MEETING
			x	x			Processing data, new manuscript
x			x	x			Corrections new manuscript by final author
					x		Improving audiovisual draft program
			x				Improving manuscript
		x					Corrections manuscript by educationist
			x	x			Processing data
			x	x	x		Preparing definitive text visuals
x			x				Discussion text visuals with final author
		x	x				Discussion text visuals with educationist
			x				Coding artwork and overlays
							MASTER-AUDIOVISUAL
					x	x	Final recording photography
						x	Framing of slides
						x	Numbering and packaging
						x	DELIVERY PHOTOGRAPHY dd:
			x				Preparing manuscript for narration
		x					Corrections by educationist
			x				Preparing narration
			x				Recording narration
							DELIVERY MASTER TAPE dd:
						x	Duplicating audiotapes
				x			Labelling audiotapes
			x	x			Processing copy for booklet
							Type-setting
			x				Proof reading
							Printing of booklet
							DELIVERY OF BOOKLET dd:
				x			Preparing programs for mailing
							PROGRAM RELEASE

Fig. 4. Production procedures and assignment of duties and responsibilities in the production design organization of the Dutch National Cancer Education Project (1984). (Fa= Final author; Ss = Scientific Supervisor; Ed= Educationist; Co= Cancer Education Coordinator; Se = Secretary; Il = Illustrator; Ph = Photographer)

Out of this meeting a draft script is composed by the project coordinator in consultation with the final author, which becomes the basis for the scenario of the instructional audiovisual program.

5.2.4.3 *The production of the try-out program*

In the design of an audiovisual program the transformation of a written text into a visual one is crucial.[55, 64]
Scientific communication is mainly a verbal process: the information is predominantly organized with words. Audiovisual communication is mainly a visual process: the information is predominantly organized with visuals.[43]
The way in which a scientific treatise is planned is basically different from the way an instructional audiovisual is planned. In the former case the thinking is expressed by words; in audiovisual planning the thinking is expressed by pictures.
Both means of communication need the building up of a logical sequence of topics. In a written text this is a logical sequence of sections; in an audiovisual this is a logical sequence of pictures. In a completed audiovisual the pictures carry the story, the words supplement the pictures.

A device for planning an audiovisual is the storyboard.[32, 43]
A storyboard is a sequence of blank cardboard frames (or something similar), where in each frame a principal point of the proposed visual content is sketched. Underneath, in the lower section of the frame, the essentials of a rough narration are written down.
The reason for following this procedure is twofold. As stated in 1976 in 'Storyboarding/Visualizing virtues', produced by the National Medical Audiovisual Center in Atlanta, Georgia, the completed storyboard is

1 - a blueprint for the proposed audiovisual, and
2 - an evaluation tool for detecting mistakes on paper before they become too expensive.[43]

Initially the Dutch National Cancer Education Project followed the traditional preproduction storyboard evaluation. However, in the multidisciplinary and multi-institutional approach of the text, with so many media laypeople participating in the storyboard meeting, the discussion frequently came to a dead end as a result of irrelevant textual discussions. They were irrelevant, because at that particular moment of the production the visuals are not yet definite, and so the complementary text cannot be definite either. Therefore a modified storyboarding procedure was introduced. Realizing that (medical) scientists have difficulty in becoming detached from a written text, it was decided to confront the co-authors at the second meeting with a more or less complete audiovisual draft program.

To maintain the basic principles for storyboarding, namely the above-mentioned blueprint and evaluation tool, in the production of the draft or try-out program, the following procedure has been used by the Dutch National Cancer Education Project since 1983.

During a period of two weeks the illustrator studies the content matter and designs a draft storyboard. The next step is an authentic storyboarding by the three members of the production team exclusively: the illustrator, the educationist and the cancer education project coordinator. The general outline of the proposed storyboard is considered, followed by a detailed discussion of each storyboard frame. If necessary, the frames are revised, rearranged and augmented or deleted, until a strong instructional audiovisual design evolves.

The rough storyboard is then shown to and discussed with the final author, who might suggest medical content improvements. It will then be processed.

Hence the production of the try-out program starts. Since this test-program is designed to be criticized by peer review, the try-out production must be as flexible as possible, in order to allow preproduction criticism and revision, avoiding expensive postproduction changes like redoing finished artwork, renarration and rephotographing.

However, because the Dutch National Cancer Education Project is limited in production time for each separate audiovisual, the production of the try-out program has to be, to a certain extent, part of the final production. That is to say, care is taken to ensure that the most time-consuming proceedings do not have to be repeated in a later stage. This is done by means of differentiating between easily flexible elements and less flexible elements in the production of the try-out program.

Easily flexible elements for the try-out program are:

- draft clinical (including pathological) slides
- draft radiological slides
- draft text slides
- draft narration tape.

The function of these elements in the try-out program is mainly to give the co-authors a preliminary impression of the kind of illustrations intended to be used. Undoubtedly during the second meeting one or more co-authors will offer better examples for a particular illustration. Consequently the production team will have the opportunity of choosing from a variety of material in the final production phase. Draft text slides will be home-made on a typewriter. The draft narration is a simple in-house recording.

Less flexible elements are the artwork drawings, because they are time-consuming. Also, the nucleus of the program will generally be with the drawings; which means that if this basis should be altered at a later stage, the whole audiovisual program design will be hold up.

Because of the restricted production time, this is impossible. The procedure

followed is, therefore, that – in consultation with the final author – drawings are prepared in a definitive form as far as possible. By using overlays, small parts of the drawings are still kept flexible.*
During the production of the try-out program the final author is frequently consulted, and regularly kept informed about the continuation of the program.
The development of the try-out program takes approximately eight weeks, and is concluded with the second general meeting in which the try-out program is presented. In preparation for this meeting the storyboard is updated concurrently with the try-out program, to be used during the storyboard meeting. It will also serve as the main working storyboard during the final production phase.

5.2.4.4 *The storyboard meeting*

The objective of the second meeting is to uncover, by means of peer review, the weaknesses of the try-out program. Like the first meeting, this one is also a three-hour afternoon session.
The participants are: the scientific supervisor, the final author, all co-authors, plus the production team.
The meeting is presided over by the project coordinator.
Agenda:
- introduction concerning the storyboarding procedures
- demonstration of the try-out audiovisual program
- discussion of the general impressions of the program
- storyboarding in detail
- questions are invited and discussed.

Attributes:
- the try-out audiovisual program
- the storyboard
- the text of the narration.

The try-out program is shown without distributing the written version of the narrated text to the co-authors in advance. The reason for this procedure is the same as that for confronting the co-authors with a more or less completed try-out audiovisual program: scientists are inclined to think verbally. They cannot detach themselves easily from the written text, even when a picture is presented at the same time. This phenomenon has been observed internationally and has been discussed, among others, by Bowen .[20]

*There is another reason for using overlays. When translating an audiovisual into another language, it is only necessary to change keywords on overlays.

During the first years of the Dutch National Cancer Education Project this problem was handled in some earlier programs by distributing a scenario* to the co-authors. Because the images in the scenario were sketched in only roughly, it was perceived that most co-authors still fixed their attention on textual details. Since at this stage of the production the text is still a proposed rough narration, it is irrelevant to waste time on too much detail.

After the try-out program is shown, the discussion starts primarily on general impressions of the overall content outline.
Following this, the whole program is discussed, now step by step in detail, using all the attributes:

- the slides of the audiovisual
- the storyboard
- the written text of the narration.

The aim of the discussion is to strive for:

- consensus on the program content
- abolition of imperfections
- supply of missing details
- discussion on clinical, pathological and radiological slides, and discussion of whether co-authors can provide/lend better pictures on particular items, thus allowing the production team to choose from a range of material
- discussion on the content of the text slides and diagrams.

The discussion is carefully noted down and the amended version becomes the basis for the definitive production.

During the course of the successive program productions it has been observed that at the end of this particular storyboard meeting, participants, now with a recognizable group identity, frequently remark that they have learned considerably from this cooperative educational effort.

5.2.4.5 *The definitive audiovisual production of the cancer education program*

The transformation of the try-out audiovisual program into the definitive program (master) runs along regular production lines.
Drawings are completed. Clinical, pathological and radiological images are selected with great care and prepared for the master version in the form of standardized 20 x 25 cm color photographs. This enables retouching parts of

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*A scenario is constructed in hand-out form like the storyboard: images and proposed narration are put together. The difference between the storyboard and the scenario is mainly in structure. The scenario is handy; the storyboard has the advantage that the frames can be shifted. Depending on the circumstances, both the scenario and the storyboard are generally used by professional production teams.

the pictures or the insertion of arrows and labels. Care is also taken to ensure that all images are horizontal, in order to allow for later recording on videotape (Slagter, 1981).[52]
The text of the narration is blocked until all the images (drawings, photographs, diagrams) are set for the master version. Not before then are steps taken to clarify the narration. At this stage a strongly coordinated final text is compiled by the project coordinator in close cooperation with, and supervised by the educationist. The final author is frequently consulted; coauthors are consulted only for sections related to their expertise. For instance, the radiologist is responsible for a correct descriptive text of the radiology slides, the pathologist for a correct descriptive text of the pathology slides, etc. The final text is clarified for narration by the project coordinator and the educationist and is shown for final approval to the final author.

Two versions are made of the definitive text, one for the narration itself and one for the accompanying text booklet. The latter is basically the same as the narration, but is slightly amended to make it a more acceptable written version.
When the text is definitive, the text slides are compiled. After approval by the final author they are sent to the printer for definitive working up.*
Narration is recorded in a professional sound studio.** Technical photography is realized by a professional audiovisual department.***

5.3 SUMMARY AND CONCLUSION

The Dutch National Cancer Education Project is established to produce audiovisual cancer education programs as supplemental resources for cancer education. The medical content of the programs is approached by multidisciplinary and multi-institutional cooperation.

The design of instructional (medical) audiovisual programs meets specific problems, dominated by the fact that (medical) scientists are inclined to think verbally. However, audiovisual communication is mAInly a visual process. In the design of an audiovisual program the transformation of a written text into a visual one is crucial.

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*The text slides and text booklets of the Dutch National Cancer Education Project are printed by ELCI, Leiden. Head: M. J. Teyn. Layout and typesetting: Mrs. P. H. Wegman-Teyn.
**For the Dutch National Cancer Education Project this is realized by JPS-Studio's, Naarden-Vesting. Head: J. Pieete, Jr.
***The Dutch National Cancer Education Project closely cooperates with the Audiovisual Department of the Netherlands Cancer Institute. Head: J. M. Lomecky.

Initially the Dutch National Cancer Education Project followed the traditional preproduction storyboard design. The participation of a varied group of medical content-matter specialists in the design of the instructional audiovisual programs creates specific problems. To overcome these problems a modified storyboarding procedure has been developed.
A detailed description of the organizational production design is discussed. Important in the development of this production design has been the definite disjunction between the responsibilities pertaining to the medical content-matter and to the design of the instructional audiovisual program.

Concluding: the Dutch National Cancer Education Project has developed an organizational production design that resulted in good multidisciplinary and multi-institutional cooperation in the construction and production of audiovisual cancer education programs.

CHAPTER 6

A STUDY OF TARGET GROUPS FOR AUDIOVISUAL PROGRAMS PRODUCED BY THE DUTCH NATIONAL CANCER EDUCATION PROJECT

6.1 FIRST STUDIES

6.1.1 Introduction

Next to the production line of the Dutch National Cancer Education Project continuously successive evaluation studies on own productions were performed. Since 1980 the following topics have been studied:

- Quality of product
- Learning effects
- Target groups.

6.1.2 Quality of product

Considering the fact that a good quality of a program is a prerequisite for learning, the first study topic was a product evaluation.
In 1981 a study was done on the multipart audiovisual program 'Metastatic Nodes in the Neck'[46] in which about 200 physicians and medical students participated (Bender, 1981). Over 95% of the participants considered this form of cancer education a useful form of complementary medical education. It was clear that availability of hardware resulted in a more positive judgment. It was also demonstrated that non-availability of hardware, especially for general practitioners and medical students, was a limiting factor in buying software. This is an important item, because these two groups are the main target groups for which the Dutch National Cancer Education Project designs the programs.

6.1.3 Learning effects

Following the product evaluation three successive evaluation studies were done on learning effects (Bender, 1981, 1982, 1984). These studies were:

- Short-term learning effects[14]
- Long-term retention[15]
- Influence of the experimental study procedures on learning effects.[16]

For these studies the multipartite program 'Metastatic Nodes in the Neck' was also used.[46]

In the first study marked short-term learning effects were shown in 300 junior clerks, with a gain in knowledge from 58% in the pretest condition to 88% in the posttest condition.
In the second study considerable long-term retention was demonstrated in 120 junior and senior clerks, with a retest score of 76% over a one-year period. An important fact was the finding that the relevant items in the program were also the most resistent items. This is important, because in the design of the programs special care is given to those topics which are considered most important.
In performing learning study experiments great care is to be given to control for disturbing factors, and consequently in the analysis for artifacts. Bender (1984) emphasized that it is important to analyze carefully whether learning effects are actually the result of the experimental variable itself, or whether it is the experimental study procedure that contributes to the measured learning effects. In the third study in 1984 he found that the experimental study procedures also contribute to learning effects.[16] He discussed the 'paradoxical relationship between learning research and (medical) education'. Learning is a complex process in which different and accumulating moments combine to increase its effects. In (medical) education one can take advantage of the extra stimuli, whatever they are, in positive manner. Bender stated: 'The relevant question is *not*: "How large is the learning effect of the stimulus?", but the relevant question is: "How can we enlarge the learning effects?".'

6.2 CURRENT STUDY: TARGET GROUPS

6.2.1 Introduction

The audiovisuals produced by the Dutch National Cancer Education Project since 1980, were aimed at medical students. In the course of time it was noticed that the programs were also viewed by other medical and paramedical disciplines. This was the reason to start a study with different target groups. For this study the question was whether different groups could benefit from the same audiovisual cancer education program. Provided that this could be demonstrated, it meant that the target audience for the programs was broader than initially considered.

6.2.2 Questions

Main question:

Do different target groups (medical and paramedical disciplines) benefit from the same cancer education audiovisual?

Subquestion 1:
Is there a knowledge-deficit on a particular topic in different target groups?

Subquestion 2:
Do learning effects occur after viewing a particular cancer education audiovisual program?

Subquestion 3:
How do the distinct contents of the audiovisual cancer education program, used for the study, contribute to the learning effects in the different target groups?

6.2.3 **Participating disciplines and data collection**

The study was performed during February 1983 till August 1983 in:
- University departments
- Cancer centers
- Community hospitals with resident training
- Community hospitals without resident training
- Continuing education programs for physicians
- Continuing education programs for nurses
- Training school for paramedicals.

Four hundred and eight persons participated in the study. From all 408 participants questionnaires were obtained; 393 questionnaires were processed.

The following disciplines participated in the study.

• Medical students	N = 44
• Specialists	37
• General practitioners	33
• General physicians	12
• Radiation technicians	22
• Nurses	104
• Paramedicals	27
• Dental students	59
• Basic scientists	12
• Biology students	7
• Paramedical students	22
• Laypeople	14

For data processing the participants were classified in six main groups.

I - Medical students (44)
II - Medical postgraduates (82)
- 37 specialists
- 33 general practitioners
- 12 general physicians

III - Radiation technicians (22)
- 9 postgraduates
- 13 students

IV - Nurses and paramedicals (131)
- 26 district nurses
- 78 nurses
- 27 paramedicals

V - Dental students (59)
- 37 second-year students
- 22 third-year students

VI - Medical laypeople (55)
- 12 basic scientists
- 7 biology students
- 22 speech-training students
- 14 laypeople

The group of the radiation technicians was classified in a separate main group because of their distinct knowledge and clinical skills in radiation oncology. This made it difficult to classify them in any other group.

Specification of participating disciplines

Medical students (44)

The 44 medical students all had completed a junior clerkship in Internal Medicine and were on duty as a junior clerk in Surgery.*

Medical specialists (37)

Internist	11
Medical oncologist	6
Radiation oncologist	5
Surgeon	2
Surgical oncologist	3
Gynecologist	1

*The Dutch medical curriculum includes six years. Four years of basic sciences and clinical theory, followed by two clinical years in which junior and senior clerkships are completed.

Orthopedic surgeon	1
Pediatrician	2
Pathologist	1
Otolaryngologist	2
Neurologist	1
Not specified	2

From the 37 medical specialists 25 were serving at an oncology unit/division of an university hospital or in a cancer center. Not all these 25 specialists were oncologists. The remaining 12 specialists were staff members of community hospitals.

General practitioners (33)

The 33 general practitioners from all over the Netherlands volunteered in the study while attending postgraduate activities in diverse hospitals.

General physicians (12)

Insurance company	1
Administrator	1
Resident – general medicine	3
Resident – radiotherapy	1
Resident – internal medicine	1
Resident – family medicine	1
Not specified	4

From these 12 general physicians five were working in a cancer center.

Radiation technicians (22)

From the 22 radiation technicians there were 9 graduates and 13 students. Nine of the students were in their final (third) year of training. Four second-year students had just started at the radiation department, following a first year training in the radiology department.

Nurses (104)

Twenty-six of the 104 nurses were district nurses; 7 of which were trained in oncology. Seventy-eight of the 104 nurses were serving in university and community hospitals. Only 2 of the 78 were trained in oncology.

Paramedicals (27)

Radiology technician	6
Dietician	3
Speech-trainer	4

Psychologist	1
Hospital attendant	3
Physiotherapist	3
Receptionist	1
Not specified	6

Dental students (59)

From the 59 dental students 37 students were in their second year of training, and 22 were in their third year of dental school. Dental students were asked to participate in the study because of the cancer prevention task of dentists in General Health.

Basic scientists (12)

Biologist	4
Biochemist	4
Pharmacologist	1
Clinical chemist	1
Microbiologist	2

Four of the 12 basic scientists were working in a community hospital and participated in the study because they attended a staff meeting. Eight of the 12 basic scientists were working in a cancer research center. They were requested to participate in the study.

Biology students (7)

The 7 biology students were working in a cancer research center. When they heard of the ongoing study, they took the initiative to participate.

Paramedical students (22)

The 22 paramedical students were in their second-year course in a school for speech-training.

Medical laypeople (14)

Audiovisual producer	1
Assistant in physics and chemistry	1
Care taker	1
Director Comprehensive Cancer Center	1
Economist	1
Minister	1
Official in Government Service	1
Receptionist Radiation Department	1
Rotary press printer	1
Secretary	1

Social worker	3
Not specified	1

One of these 14 people had been cured of Hodgkin's disease and was chairman of the Association of Hodgkin Patients. Initially laypeople were not to be included in the study. This group was identified during data processing. They had participated in the study while attending staff or regional meetings.

6.2.4 **Experimental design**

The experimental design consisted of two parallel tests A and B, each being alternatingly used as a pre- or posttest. An audiovisual program was demonstrated between the tests.
Participants were randomly divided into two groups: studygroup 1 and studygroup 2. This was done by distributing alternatingly the questionnaires with test A (green color) and test B (yellow color). Studygroup 1 took pretest A, then viewed the program, and took posttest B. Studygroup 2 took pretest B, then viewed the program, and took posttest A. In this way both group 1 and group 2 were experimental and control group. The experimental design is presented in Fig. 5.

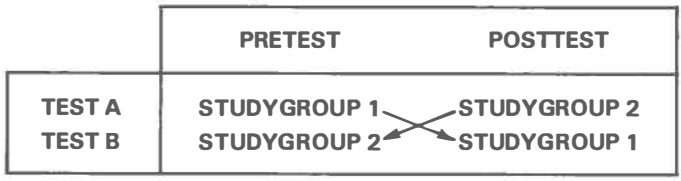

Fig. 5. Experimental Design.

This cross design can be applied when equivalence of the studygroups 1 and 2 is assumed. This equivalence of the studygroups can be demonstrated by introducing 'neutral' questions in the pre- and posttest. Neutral questions are not related to the content matter of the experimental audiovisual program. After establishing the equivalence of the studygroups involved, the influence of the program can be measured.
The tests were taken by questionnaires. Test A was composed of 9 items and test B of 10 items, most of the 'True / False / Don't know' type. In both tests there was one question of the multiple choice type. One question was omitted before data processing (Section 6.2.5).

For the study two programs, produced by the Dutch National Cancer Education Project, were choosen:

a - A general introduction to Hodgkin's disease[67, 68]

b - A general introduction to Metastatic Nodes in the Neck[46].

The program on Hodgkin's disease was used in the study design in between the pre- and posttest. The program on Metastatic Nodes in the Neck provided the neutral items which were required to prove the equivalence of the groups 1 and 2.

6.2.5 **Instruments**

Test A* 1 - Hodgkin's disease practically always is fatal.
True / False / Don't know

2 - Hodgkin's disease is a metastatic disease of the lymphoreticular tissues. True / False / Don't know

3 - The first manifestation of Hodgkin's disease may be a lump in the neck, *without* any other complaints.
True / False / Don't know

4 - Hodgkin's disease is mainly seen in patients under age 15.
True / False / Don't know

5 - In regionally localized Hodgkin's disease prophylactic radiotherapy is an indispensable part of the radiotherapy.
True / False / Don't know

6 - The treatment of choice in regionally localized Hodgkin's disease is combination chemotherapy.
True / False / Don't know

7 - Ann Arbor classification stage II indicates lymph node involvement on *both* sides of the diaphragm.
True / False / Don't know

8 - A metastatic node in the neck from a (yet) unknown primary tumor indicates in more than 50% of the cases that the primary is located in the naso-, oro-, or hypopharynx.
True / False / Don't know

9 - A 52-year old male consults you. He mentions a small, painless, solid lump in the neck, localized below the angle of the left jaw. First thoughts are on:
a congenital condition / inflammation / a benign bumor / malignancy / don't know

Concerning question A-2

This question was omitted before data processing. In retrospect the wording

*The Dutch version of the question is included as Appendix C.

of the question was incorrect. This was realized during analysis of the answers. The question was meant to be the counterpart of question 2 in test B, and the correct formulation of the question should have been: 'Hodgkin's disease is a metastatic disease in the lymphoreticular tissues of a primary tumor outside the lymphoreticular system. True / False / Don't know'. The incorrect wording of the question resulted in many 'true' and 'false' answers, both to be considered as a good answer.

Concerning questions A-8 and A-9

These were the neutral questions that were required to demonstrate the equivalence of the experimental groups 1 and 2.

Test B* 1 - The 5-year survival rates of Hodgkin's disease are over 60%.
True / False / Don't know

2 - Hodgkin's disease is a primary neoplasm of the lymphoreticular tissues. True / False / Don't know

3 - A patient with Hodgkin's disease usually will seek advice for the first time because of a painless lump in the neck.
True / False / Don't know

4 - The diagnosis of Hodgkin's disease can be based on the clinical characteristics. True / False / Don't know

5 - In patients with Hodgkin's disease irradiation of the neighbouring uninvolved lymphatic regions improves the survival rates. True / False / Don't know

6 - In advanced Hodgkin's disease combination chemotherapy is the treatment of choice. True / False / Don't know

7 - Involvement of a single lymph node region, combined with general symptoms as fever, night sweats and/or weight loss, is classified as stage I-B according to the Ann Arbor classification. True / False / Don't know

8 - A left supraclavicular metastatic lymph node may be generated by a tumor of the testicle. True / False / Don't know

9 - A 10-year old girl comes to your office because of a soft and sore lump in the neck. First thoughts are on:
a congenital condition / inflammation / a benign tumor / malignancy / don't know

10 - Prophylactic irradiation in Hodgkin's disease means: irradiation of neighbouring uninvolved lymphatic regions.
True / False / Don't know

Concerning questions B-8 and B-9

These were the neutral questions that were required to demonstrate the equivalence of the experimental groups 1 and 2.

*The Dutch version of the questions is included as Appendix C.

6.3 RESULTS

6.3.1 Knowledge test and learning effects

First it had to be demonstrated whether there was a knowledge deficit concerning Hodgkin's disease in the different target groups (subquestion 1) and whether learning effects did occur after viewing the program (subquestion 2). The results on the main groups are presented in Table 19.

TABLE 19.
KNOWLEDGE TEST AND LEARNING EFFECTS ON HODGKIN'S DISEASE IN SIX DIFFERENT TARGET GROUPS BEFORE AND AFTER VIEWING THE AUDIOVISUAL CANCER EDUCATION PROGRAM.

		Study groups			Mean % correct answers	
Target groups	N	1	2		pretest	posttest
I Medical students	44	19	25	test A	83	99
				test B	71	97
II Medical graduates	82	37	45	test A	85	96
				test B	73	98
III Radiation technicians	22	9	13	test A	72	94
				test B	67	90
IV Nurses and paramedicals	131	64	67	test A	56	82
				test B	62	88
V Dental students	59	31	28	test A	41	92
				test B	30	94
VI Laypeople	55	28	27	test A	28	84
				test B	25	87
	393	188	205			

6.3.2 Distinct content contribution to learning

Subquestion 3:

How do the distinct contents of the audiovisual cancer education program, used for the study, contribute to the learning in the different target groups?

For the analysis of the contents, the topics of the program on Hodgkin's disease were classified according to the following items.

	Questions:
• General knowledge	A-1, B-1, B-2
• Clinical aspects	A-3, A-4, B-3
• Diagnosis based on pathology	B-4
• Radiotherapy	A-5, B-5, B-10
• Chemotherapy	A-6, B-6
• Clinical staging	A-7, B-7

For data processing the six main groups collectively were compared in the pretest and in the posttest condition. The overall results are presented in Table 20.

TABLE 20.
CONTRIBUTION OF THE DISTINCT CONTENTS OF THE AUDIOVISUAL CANCER EDUCATION PROGRAM ON HODGKIN'S DISEASE TO THE LEARNING IN THE DIFFERENT TARGET GROUPS.

	Mean percentages correct answers					
Target groups*	I	II	III	IV	V	VI
General knowledge						
pretest	90	89	91	82	57	45
posttest	98	99	100	97	93	96
Clinical aspects						
pretest	84	85	77	77	42	36
posttest	100	99	97	94	97	91
Diagnosis based on pathology						
pretest	96	96	30	52	50	11
posttest	100	92	67	78	84	75
Radiotherapy						
pretest	49	64	63	57	37	23
posttest	95	98	100	91	97	90
Chemotherapy						
pretest	77	73	77	44	29	15
posttest	100	96	82	69	75	73
Clinical staging						
pretest	66	62	27	22	7	9
posttest	98	93	95	73	92	71

*I = Medical students; II = Medical graduates; III = Radiation technicians; IV = Nurses and paramedicals; V = Dental students; VI = Laypeople.

6.4 DISCUSSION

6.4.1 Aspects of studies on learning effects

Research on learning effects is regularly performed in three steps:

1 - Administering a pretest.
2 - Demonstrating a program.
3 - Administering a posttest.

When the score in the posttest condition is higher than the score in the pretest condition, it is assumed that learning has occurred.
However, there are several pitfalls in the interpretation of outcomes on this design, because diverse interfering factors are involved. In the preceding evaluation research projects on audiovisual cancer education programs produced by the Dutch National Cancer Education Project (Section 6.1) Bender[14, 15, 16] evaluated these problems, which in sum are:

- *Cueing.* This phenomenon arises when the program is shown immediately after the pretest. In that case the pretest might force the viewer to focus attention only on certain parts of the audiovisual, perhaps diminishing attention on other parts of the program.
- *Pretest sensitization.* It could be that the pretest directs attention and perception to the topic in a way that the audiovisual program alone could not have originated.
- *Short-term memory recall.* A posttest taken immediately after the audiovisual program might reflect only short-term memory results.
- *Differences in difficulty between the pretest and posttest instruments.* This problem might be compensated as much as possible by striving to have similar topic questions in both the pretest and posttest, meaning that these questions should be each other's counterparts.
- *Hawthorne effects.* The Hawthorne phenomenon comprises the possible influence on the experimental results of trivial factors caused by the organization and preparation of the research conditions.
- *Absence of data concerning the production design and technical realization.* Poor learning effects might be a reflection of poor audiovisual program quality.

Consequently it should be realized that demonstrated learning effects might be due to other influences than the experimental variable (the audiovisual program) itself. These were discussed by Bender.[14, 15, 16] They are not brought into the following discussion again.

6.4.2 Examination of the study results on different target groups

Table 19 (page 115) reveals that the scores in the pretest condition are not the same in the different target groups, but that was to be expected. However, in

all target groups it is obvious that there was something to be learned. In the posttest condition the scores have increased for all groups in the same positive direction, the lowest posttest score being 82% in the group of the nurses and paramedicals.
It is evident that all groups have learned from the program, although not to an equal extent.

Groups I and II

Concerning the first two groups, medical students and medical graduates, the scores in the pre- and posttest condition were nearly similar. That was a reason to take a closer look at the studygroups of the medical graduates. The results are presented in Table 21.

TABLE 21.
KNOWLEDGE TEST AND LEARNING EFFECTS ON HODGKIN'S DISEASE IN THREE SUBGROUPS OF MEDICAL GRADUATES BEFORE AND AFTER VIEWING THE AUDIOVISUAL CANCER EDUCATION PROGRAM.

		Study groups			Mean % correct answers	
Subgroups medical graduates	N	1	2		pretest	posttest
Specialists*	37	18	19	test A	95	96
				test B	77	99
General practitioners	33	14	19	test A	75	97
				test B	70	97
General physicians	12	5	7	test A	77	93
				test B	73	95
	82	37	45			

*From the 37 specialists 12 were oncologists according to the criterion for classification in the AACE/NCI Cancer Education Survey (Section 2.4.1).

Table 21 reveals that except for studygroup 1 of the specialists in pretest A, all other studygroups scored in the pretest condition about 75%. The idea rose that the higher score was due to an unequal distribution of the oncologists in the studygroups 1 and 2. However, analysis revealed an equal distribution of oncologists over both studygroups. Furthermore, Table 19 (page 115) shows in target groups I, II and V a similar pattern. These target groups have in common that the medical and dental curriculum comprises lectures

on the lymphoreticular system. Both aspects mentioned may suggest that test A was probably easier than test B.
Considering the fact that in the pretest condition five sixths of the medical graduate studygroups scored a mean percentage of about 75, it might be concluded that apparently there was something to be learned. And it is evident that the audiovisual program contributed adequately to learning.

Groups III and IV

The same goes for Group III: the radiation technicians, and Group IV: nurses and paramedicals. In the latter group there was a reason to take a closer look whether there was a difference in cancer knowledge between district nurses and hospital nurses. It was considered that, in general, district nurses are much more close to the patient and the family than regular nurses, and consequently might be confronted more frequently with cancer problems. The analysis of the subgroups is presented in Table 22.

TABLE 22.
KNOWLEDGE TEST AND LEARNING EFFECTS ON HODGKIN'S DISEASE IN THREE SUBGROUPS OF NURSES AND PARAMEDICALS BEFORE AND AFTER VIEWING THE AUDIOVISUAL CANCER EDUCATION PROGRAM.

Subgroups nurses and paramedicals	N	Study groups 1	2		Mean % correct answers pretest	posttest
District nurses	26	13	13	test A	76	81
				test B	73	95
Nurses	78	38	40	test A	51	85
				test B	61	90
Paramedicals	27	13	14	test A	51	74
				test B	55	75
	131	64	67			

A difference in amount of cancer knowledge between district nurses and regular nurses in pretest knowledge is demonstrated. This could indicate that district nurses do have different oncology knowledge needs than hospital nurses.

Group V

In Group V, the dental students, there was a reason to take a closer look at the subgroups, because the second-year students were not yet familiar with diseases of the lymphoreticular system. The third-year students had been lectured on the topic a few months before. The analysis of the subgroups is presented in Table 23.

TABLE 23.
KNOWLEDGE TEST AND LEARNING EFFECTS ON HODGKIN'S DISEASE IN TWO SUBGROUPS OF DENTAL STUDENTS BEFORE AND AFTER VIEWING THE AUDIOVISUAL CANCER EDUCATION PROGRAM.

		Study groups			Mean % correct answers	
Subgroups dental students	N	1	2		pretest	posttest
Second-year students	37	19	18	test A	30	90
				test B	21	91
Third-year students	22	12	10	test A	60	95
				test B	46	98
	59	31	28			

The difference in pretest knowledge — due to a certain familiarity with the subject 'diseases of the lymphoreticular system' — is demonstrated.
It is also evident that the program contributed adequately to further knowledge on the subject.

Group VI

Out of curiosity on the extent of the program contribution to the knowledge of medical laypeople, a closer look was given to subgroups in Group VI. The analysis is presented in Table 24.

TABLE 24.
KNOWLEDGE TEST AND LEARNING EFFECTS ON HODGKIN'S DISEASE IN SUBGROUPS OF MEDICAL LAYPEOPLE BEFORE AND AFTER VIEWING THE AUDIOVISUAL CANCER EDUCATION PROGRAM.

		Study groups			Mean % correct answers	
Subgroups medical laypeople	N	1	2		pretest	posttest
Basic scientists + biology students	19	11	8	test A	36	96
				test B	41	97
Speech training students + laypeople	36	17	19	test A	23	79
				test B	22	79
	55	28	27			

These data reveal that the audiovisual cancer education program on Hodgkin's disease also had a rather large learning potential in these subgroups.

6.4.3 **Program content contribution in different target groups**

Table 20 (page 116) reveals the contribution of the distinct content areas of the audiovisual cancer education program on Hodgkin's disease to the learning in the different target groups. A few remarks on the details are to be discussed.
With reference to the topic on radiotherapy it was a surprise to find in the three first groups (medical students, medical graduates, radiation technicians) such a big gap in basic knowledge on radiation oncology. It is evident that the audiovisual has been clear on this topic for all groups.
With reference to the topic on chemotherapy it is, in the posttest noteworthy that this part of the audiovisual evidently has not taught the latter four groups as much as on radiotherapy. The explanation might be that in the program on Hodgkin's disease most of the attention is focussed on radiotherapy. Only small attention is given to chemotherapy because in the audiovisual education programs as a rule those aspects are avoided which are prone to alteration in the near future.
The question should be considered whether all the program items are relevant to each group. Before going further into this topic it should be repeated how the audiovisual cancer education programs produced by the Dutch National Cancer Education Project are intended to be used (Chapter 5, Section 5.1).

a - *Self-instruction* — in the framework of a multifaceted medical education system, providing the opportunity to acquire in a short period of time (approximately half an hour) multidisciplinary basic oncology knowledge about a particular oncologic item.
b - As an *aid to lecturers*, like surgeons, radiotherapists, internists, pathologists, etc. who would then be able to develop their lectures as an expansion upon the basic multidisciplinary knowledge of a particular malignant disease already learned from a self-instructional program, thus precluding unnecessary duplications of effort.

6.4.4 **Relevancy**

All the information in the program is not always relevant to every target group. However, it should be recognized that the production of the audiovisuals is commissioned for use by medical students. That explains why certain content items do not fit the specific requirements of all groups.
It is also evident that each audiovisual program will not have the same interests in different disciplines. For instance, a program with basic knowledge on Radiation Oncology will reach another audience than a program with basic knowledge on Tumors of the Parotid Gland. However, it is worth taking a closer look at the different target groups, and to contemplate whether the program on Hodgkin's disease was relevant or irrelevant to the diverse groups.

Medical graduates

Medical graduates, general practitioners and general physicians in particular, are not considered to have ready knowledge of every malignant disease, especially when the incidence of the disease is low.
On the other hand, to provide optimal care when dealing with a patient who is exposed to that particular malignant disease, the physician should at least know how to handle aspects like early diagnosis, adequate referrals and adequate emotional support for the patient during periods of diagnosis, staging, treatment and follow-up.
Competence is related to knowledge, attitudes and performance. The 1982 Report of the Council of Medical Education of the American Medical Association on 'Future Directions for Medical Education' opens with the remark that the major theme of the report is 'the balance between generalism and specialism required to permit individuals to develop into well-educated physicians ...'.[26]

Cancer ignorance is widespread and dangerous (UICC report Vol. 39, 1980).[12] In the 1978 UICC report, Vol. 31, a section is devoted to the beliefs and attitudes of medical doctors concerning oncology. The serious implications of fatalism and ignorance among doctors and nurses about cancer is discussed.[65]
In the current study general practitioners and general physicians scored a mean percentage of 74 in the pretest condition on basic knowledge on Hodgkin's disease, and a mean percentage of 96 in the posttest condition. This demonstrates that there is something to be learned in this target group and that learning effects have occurred.
It can be concluded that the program is relevant to medical graduates, as represented by the experimental group.

Radiation technicians

Basic knowledge on a disease which is predominantly treated in early stages by radiotherapy should be insight knowledge of every radiation technician, especially also because of their proximity to the patient nearly every day during several weeks of treatment.
The data in Tables 19 (page 115) and 20 (page 116) clearly reveal that there is still something to be learned and that learning effects do occur after viewing the program. It is well recognized that some of the items should have been handled in another way, if the program had been designed specifically for radiation technicians.
However, it can be concluded that the program is relevant to this 'target group', but that slight alterations should be introduced.

Nurses and paramedicals

In the UICC report, Vol. 39 (1980) on 'Basic Concepts in Cancer Nursing' it is stated that 'Many countries lack educational material for providing both the professional nurse and the second-level nurse with baseline information about prevention, early detection, treatment, care and rehabilitation of patients suffering from cancer.'[12]
In the same report an outline is given on basic knowledge for nurses on different malignant diseases. For Hodgkin's disease the extent of the recommended knowledge runs completely parallel with the content of the audiovisual cancer education program.
It should be emphasized that also for nurses the aim of the audiovisual cancer education programs is *not* that every nurse should have ready knowledge of all cancer facts. The aim is to give the opportunity to take cognizance of multidisciplinary basic oncology knowledge on a particular malignant

disease in a short period of time; basic knowledge that is necessary for providing quality care to the patient who suffers from that particular malignant disease.
The same goes for paramedicals, for instance speech-trainers. These health care professionals might benefit from an audiovisual cancer education program on particular malignant diseases in the Head and Neck area, for example a program on Cancer of the Larynx, or on Metastatic Nodes in the Neck.

Dental students

Dental students were asked to participate in the study because of the cancer prevention task of dentists in General Health. Dentists are practically the only health care professionals who regularly see sections of the population. Thus dentists should be able to interpret every visible and palpable abnormality in the Head and Neck area and to take adequate action.
In over 70% of the cases of Hodgkin's disease the first obvious manifestation is a painless enlargement of a lymph node in the neck. Consequently knowledge on certain aspects of the disease is relevant for dentists. The data in the Tables 19 (page 115), 20 (page 116) and 23 (page 120) reveal that something was to be learned, and that learning did occur.

Basic scientists

The data in Table 24 (page 121) reveal that basic scientists can benefit from the programs. This might be the case when knowledge on a particular malignant disease is required, for instance in research, but also in education. Basic scientists involved in integrated multidisciplinary cancer education should have fundamental knowledge and adequate attitudes on clinical concepts, as is demonstrated in the AACE/NCI Cancer Education Survey (A.5.5.2).

6.5 SUMMARY AND CONCLUSION

The audiovisual programs produced by the Dutch National Cancer Education Project since 1980 were aimed at medical students. In the course of time it was noticed that the programs were also viewed by other medical and paramedical disciplines. This was the reason to start a study with different target groups, in which it could be shown that:

- apparently in all groups there were knowledge deficits
- the given audiovisual cancer education program had evident learning effects in all groups
- the different contents in the program did contribute to learning.

Conclusion: audiovisual cancer education programs, containing basic multidisciplinary oncology information can be used effectively by different target groups. Multidisciplinary cancer knowledge about a particular malignant disease can be acquired in a short period of time, approximately half an hour. Slight alterations in the instructional audiovisual programs may have to be introduced for selected target groups.

CHAPTER 7

SUMMARY AND CONCLUSIONS

Introduction

In this thesis a study is reported on some aspects of cancer education in the Dutch Medical Schools. As a basis for this study has served a nationwide, well documented Survey on Cancer Education in the U.S. Medical, Dental and Osteopathic Schools. This U.S. 'Cancer Education Survey' was performed during the period August 1975 - December 1979, and was accomplished by the American Association for Cancer Education in contract with the National Cancer Institute of the U.S. Department of Health and Human Services.

By documenting the cancer education methods used in virtually all the medical schools in the U.S.A., the Survey sought to record and analyze the cancer education programs which appeared most effective. The Cancer Education Survey revealed medical school characteristics which were found *favorable* or *unfavorable* to the development of effective undergraduate cancer education programs. Due to the multidisciplinary nature of oncology, one of the most important favorable medical school characteristics appeared to be the presence of a coordinated integrated multidisciplinary cancer education program.

One of the practical problems in planning a medical curriculum is the time allocated to various medical disciplines. Therefore it was considered of importance to look for and to develop learning aids that contribute to a multidisciplinary cancer education curriculum within the time constraints of that curriculum, thus leaving the professional teachers enough time for teaching in their own specific field of oncology.

For this reason the potentials of audiovisual cancer education are also analyzed and reported in this thesis.

Chapter 1 - Excerpts of a Cancer Education Survey in the U.S.A., used as a basis for a Cancer Education Study in the Netherlands

Presentation of the results of the U.S. Cancer Education Survey was facilitated by dividing the data into two major sections with a series of subsections. The major topics were related to characteristics of the Institutional Environments which were considered relevant to medical student cancer education programs. These included aspects of financial, administrative,

and physical facilities and patient care resources; and to the content of the Cancer Education Programs with relationship to selected institutional characteristics. This included consideration of the variety and multidisciplinary nature of educational activities as well as an analysis of specific programs involving oncologic specialty experiences, outpatient clinic experiences, elective opportunities, and psychosocial aspects of oncology. In the statistical methods used in the U.S. Cancer Education Survey the institutional characteristics were related as independent variables and the content characteristics as dependent variables. In this way an attempt was made to quantify characteristics favorable and unfavorable to the development of effective cancer education programs.
In this chapter a number of these characteristics are discussed. These characteristics have served as a basis for the Dutch Cancer Education Study. For those readers who are interested in more information on important findings from the U.S. Cancer Education Survey, a more complete review is added in Appendix A. The reason to include a comprehensive abstract from the six-volume reports of the U.S. Cancer Education Survey is the fact that the well documented Survey provides results and insight in causes and effects which are of value to medical schools who want to innovate their teaching efforts in oncology.

Chapter 2 - The Dutch Cancer Education Study, 1983

The Dutch Cancer Education Study is related to the period of September 1982 - September 1983. One hundred and seventy-four faculty members participated in the Study, representing 74% of clinical departments of all eight medical schools. The investigated cancer education aspects pertained to features of institutional environments with regard to cancer education; and to activities and attitudes of the clinicians among the medical school faculty members concerning cancer education.
Among the findings from the U.S. Cancer Education Survey were institutional characteristics with a definite favorable impact to the development of effective cancer education programs. These characteristics were among others a multidisciplinary Cancer Education Committee with representation of the cancer education program on the School's Curriculum Committee, and with access to funds specifically designated for undergraduate cancer education; and a Division of Cancer Education headed by a Cancer Education Program Director or Cancer Education Coordinator.
The Dutch Study revealed that in the period September 1982 - September 1983 there were scarcely any Institutional Cancer Education characteristics recognizable. In two of the eight medical schools existed a Cancer Education Committee, of which only one school had a representative for cancer education in the School's Curriculum Committee. A Division for Cancer

Education did not exist in any of the medical schools. A separate budget for undergraduate cancer education was not available in any of the medical schools. In none of the schools a Cancer Education Program Director was appointed. That faculty members considered such a position of importance was expressed by the fact that in five of the eight medical schools the function of a Cancer Education Coordinator was performed on a voluntary basis by one of the faculty members. In the period September 1982 – September 1983 structured multidisciplinary cancer education programs were recognizable in only a few Dutch medical schools.
The majority of the faculty members in the Dutch Study agreed with the statement that a cancer curriculum should be required for all medical students. Most of the Oncologists tended to believe that cancer education should primarily be conducted by a Division of Oncology; this was also the opinion of nearly fifty percent of the participating Non-Oncologists.
Chapter 2 provides detailed information on the Dutch Cancer Education Study. The chapter is completed with a number of recommendations based on the combined findings of the U.S. Cancer Education Survey and the Dutch Study.

Chapter 3 – Aspects of audiovisual education

A historical review reveals that a defined technology of media instruction has been developed only since the late 1960's. Instructional media in Higher Education are not yet fully taken advantage of. In several American and European reports on the subject, published in the early 1970's, various aspects of (audiovisual) media instruction are discussed among other things. A report from the Carnegie Commission on Higher Education, published in 1972, included next to several short-term recommendations a series of 'reasonable goals for 1980-2000'. The nucleus of those recommendations and goals centers on the importance of quality instructional materials.
First training programs for instructional *medical* media technology have been initiated in the early 1970's and are established mainly in North America, Great Britain and the British Commonwealth. Not before 1981 general criteria for the quality of Instructional Audiovisual Materials for Health Professionals were defined and set out in the United States. The guidelines pertained to content, instructional design, technical production and packaging.
In this chapter also the need is outlined to provide administrators and decision-makers with sound and practical guidelines for media selection procedures, with an accent on the importance of selection being based on instructional effectiveness; and on the consideration that the costs of an instructional program are justifiable when the program is to be used by many people in a clear defined period of time.

Chapter 4 - A study on the availability and use of audiovisual cancer education materials in the Netherlands, 1983

In the U.S. Cancer Education Survey the data revealed that an interest in instructional audiovisual cancer education materials did exist among medical teachers. However, the data also suggested that there was a shortage of good quality audiovisual cancer education programs. The need for the development of more and better audiovisual cancer education materials was indicated (in 1979).
In the Dutch Cancer Education Study (Chapter 2) questions were added to provide an impression on the availability and the use of audiovisual cancer education programs in the Netherlands. The data revealed that medical faculty members were not always well-informed concerning audiovisual library facilities in their medical school, even when a central audiovisual library was availale in the school. Most of the instructional audiovisuals recognized by faculty respondents as pertaining especially to oncology, were produced by the Dutch National Cancer Education Project. Several faculty respondents advised (in 1983) the production of more audiovisual cancer education programs; several other faculty respondents asked for more information on the availability of such materials.

Chapter 5 - The Dutch National Cancer Education Project

The Dutch National Cancer Education Project is a nationwide project, financed by the Netherlands Queen Wilhelmina Cancer Foundation. The Project is established to produce audiovisual cancer education programs. The medical content of the programs is realized by multidisciplinary and multi-institutional cooperation. The programs provide basic clinical knowledge on various oncologic topics. They can be used for self-instruction, providing the opportunity to acquire in a short period of time (approximately half an hour) multidisciplinary basic clinical knowledge; and they can be used as an aid to clinical teachers, providing the opportunity to expand their lectures on the basic multidisciplinary knowledge already learned from the instructional program, thus precluding unnecessary duplication of efforts. Instructional audiovisuals, of which the text is approached by multidisciplinary and multi-institutional cooperation, create specific problems in the organizational production design. To overcome these problems a modified storyboarding procedure has been developed, of which a detailed description is reported.

Chapter 6 – A study of target groups for audiovisual programs produced by the Dutch National Cancer Education Project

Next to the production line of the Dutch National Cancer Education Project evaluation studies on own productions were performed since 1981. The first study pertained to the quality of the product, followed by three successive studies on learning effects. The first of these three studies was on short-term learning effects, the second study on long-term retention, and the third one on the influence of extrinsic stimuli on learning effects.
The current study relates to the possibility whether the audiovisual programs, originally made for medical students, could also be used by other medical and paramedical disciplines. This was the reason to start a study with different target groups. It was demonstrated that different target groups could benefit to a great extent from the same audiovisual cancer education program. Disciplines who participated in the study were: medical students, general practitioners, medical specialists, radiation technicians, nurses, paramedical disciplines, dental students, basic scientists, and medical lay-people.

Conclusions

- Cancer education should reflect the multidisciplinary character of oncology.
- For effective cancer education programs sound coordination in a multidisciplinary oncology curriculum is necessary.
- To provide medical teachers the opportunity to highlight own discipline expertise, it is of utmost importance to look for and to develop learning aids that contribute to precluding unnecessary duplication of efforts in a multidisciplinary oncology program within the time constraints of the medical curriculum.
- Audiovisual cancer education programs, containing multidisciplinary basic oncology information, can provide in approximately half an hour general knowledge about a particular malignant disease. These audiovisuals can be used effectively by different target groups.

CHAPTER 8

SAMENVATTING EN CONCLUSIES

Inleiding

In dit proefschrift wordt onder andere verslag gedaan van een ondezoek naar een aantal aspecten van onderwijs in de oncologie aan de Nederlandse Medische Faculteiten. Uitgangspunt is een groot, goed gedocumenteerd onderzoek dat over de periode 1976-1979 is verricht bij vrijwel alle medische faculteiten in de Verenigde Staten. Dat onderzoek staat bekend als de 'Cancer Education Survey' en is uitgevoerd door de American Association for Cancer Education in samenwerking met het National Cancer Institute. Een van de doelstellingen van het Amerikaanse onderzoek was na te gaan welke factoren van belang waren voor een effectief onderwijsprogramma in de oncologie voor medische studenten, met name wat betreft activiteiten en instelling van faculteitsbestuurders, faculteitsleden en medische studenten ten opzichte van het oncologisch onderwijs. Een van de belangrijkste aspecten voor de ontwikkeling van een adequaat oncologisch onderwijscurriculum bleek samen te hangen met het specifiek multidisciplinaire karakter van de oncologie waardoor coördinatie en integratie in een multidisciplinair oncologiecurriculum onmisbaar zijn.
Omdat een van de praktische problemen in de planning van een medisch curriculum de tijd is die onder verschillende medische disciplines moet worden verdeeld, lijkt het verstandig om naar hulpmiddelen te zoeken die in een multidisciplinair oncologiecurriculum op dusdanige wijze een rol kunnen spelen, dat docenten de beschikbare onderwijstijd optimaal kunnen benutten voor het overdragen van eigen specifieke kennis.
In dit proefschrift wordt daarom ook verslag gedaan van de mogelijkheden van audiovisueel oncologisch onderwijs.

Hoofdstuk 1 – Excerpts uit de Amerikaanse 'Cancer Education Survey' die als basis gebruikt zijn voor het Nederlandse onderzoek naar een aantal aspecten van het onderwijs in de oncologie

Voor het Amerikaanse onderzoek naar de situatie van het oncologieonderwijs aan de 'medical schools' werden twee hoofdlijnen gevolgd. Vastgelegd werden karakteristieken van de faculteit in relatie tot het oncologieonderwijs; met name bestuurlijke en financiële aspecten, en de wijze van patientenzorg. Voorts karakteristieken van het onderwijsprogramma in de onco-

logie naar inhoud; met name naar de gevarieerdheid en het multidisciplinaire karakter, alsmede meer specifieke aspecten zoals klinische ervaringen van medische studenten, stage-mogelijkheden op oncologische poliklinieken, aandacht voor psychosociale aspecten, en het bestaan van keuzepakketten. Na de bewerking van de gegevens was het mogelijk karakteristieken aan te geven die een *positieve* respectievelijk *negatieve* invloed bleken te hebben op de ontwikkeling van een effectief oncologisch curriculum.
In dit hoofdstuk wordt een aantal van deze factoren besproken; deze hebben tevens als basis gediend voor het Nederlandse onderzoek.
Een meer uitgebreid verslag van het Amerikaanse onderzoek is verwerkt in Appendix A. De reden om dit te doen is, dat het Amerikaanse onderzoek duidelijke gegevens heeft opgeleverd die belangrijk kunnen zijn voor medische faculteiten die hun onderwijsprogramma in de oncologie willen verbeteren.

Hoofdstuk 2 - Het Nederlandse onderzoek naar een aantal aspecten van het onderwijs in de oncologie

Het onderzoek naar een aantal aspecten van het onderwijs in de oncologie aan de Nederlandse Medische Faculteiten heeft betrekking op de periode september 1982 - september 1983. Aan het onderzoek namen 174 faculteitsleden deel als representant van 74% van de klinische afdelingen in de acht medische faculteiten. De aspecten van het oncologieonderwijs die onderzocht werden hadden betrekking op mogelijkheden van facultaire aard voor het oncologieonderwijs; en op activiteiten in, en instelling ten opzichte van het oncologieonderwijs door klinische faculteitsleden.
Een van de bevindingen van het Amerikaanse onderzoek was, dat vruchtbare oncologische onderwijsprogramma's een duidelijk multidisciplinaire structuur vertoonden. De voorwaarden voor het welslagen van een oncologieonderwijsprogramma bleken voornamelijk gerelateerd aan twee voorwaarden: een multidisciplinair samengestelde actieve oncologieonderwijscommissie, met vertegenwoordiging in de curriculumcommissie van de faculteit, en met een eigen budget speciaal voor onderwijsdoeleinden aan medische studenten; en van de aanwezigheid van een effectief functionerende 'Cancer Education Program Director' of 'Cancer Education Coordinator'.
In het Nederlandse onderzoek bleek dat in de periode september 1982 - september 1983 slechts in twee van de acht Nederlandse medische faculteiten een onderwijscommissie voor de oncologie bestond; met slechts in een van de twee faculteiten een representant in de curriculumcommissie van de faculteit. In geen van de faculteiten bestond een aparte afdeling oncologieonderwijs, er was geen formatieplaats aanwezig voor een oncologieonderwijscoördinator, noch een apart budget voor het oncologieonderwijs

aan studenten. Dat faculteitsleden de functie van een coördinator belangrijk achtten, bleek uit het feit dat in vijf van de acht faculteiten deze functie op vrijwillige basis door een van de stafleden werd waargenomen. Een gestructureerd multidisciplinair oncologieprogramma bestond in de onderzoeksperiode slechts in enkele van de Nederlandse Medische Faculteiten.
De meerderheid van de faculteitsleden die in het Nederlandse onderzoek participeerden waren van mening dat een oncologiecurriculum verplicht zou moeten zijn voor alle medische studenten. De meeste oncologen in het onderzoek waren van mening dat het oncologieonderwijs door een oncologieafdeling moet worden verzorgd; deze mening werd ook door bijna de helft van het aantal niet-oncologen gedeeld.
Hoofdstuk 2 geeft gedetailleerde informatie over het Nederlandse onderzoek en besluit op grond van gecombineerde bevindingen van zowel het Amerikaanse als het Nederlandse onderzoek met een aantal aanbevelingen.

Hoofdstuk 3 - Aspecten van audiovisueel onderwijs

In een historisch overzicht wordt duidelijk dat gestructureerde opleidingen voor het ontwerpen van audiovisuele instructieprogramma's pas in de laatste twintig jaar zijn ontstaan. De mogelijkheden van audiovisuele instructie worden in het Hoger Onderwijs nog onvoldoende benut. In een aantal belangrijke rapporten uit het begin van de zeventiger jaren zowel in Europa als in de Verenigde Staten uitgebracht, werden de diverse aspecten van de toepassing van (audiovisuele) onderwijsmedia belicht. In een rapport van de Carnegie Commission on Higher Education werden reeds (in 1972) 'reasonable goals' voor de jaren 1980-2000 gegeven. Het belangrijkste van die aanbevelingen was onder meer de noodzaak tot stellen van kwaliteitseisen aan audiovisuele instructieprogramma's.
Gestructureerde opleidingen voor het ontwerpen van *medische* audiovisuele instructieprogramma's zijn pas in het begin van de zeventiger jaren ontstaan, en bevinden zich voornamelijk in Noord-Amerika, Engeland en het Britse Gemenebest. Pas in 1981 werden in de Verenigde Staten algemene criteria opgesteld voor kwaliteitsvoorwaarden van medische audiovisuele onderwijsprogramma's. Richtlijnen werden gegeven voor mediakundige en onderwijskundige inhoudelijke aspecten, technische kwaliteit en de uitvoering.
In dit hoofdstuk is tevens aandacht geschonken aan de noodzaak om ten behoeve van bestuurders in verband met beleidsbeslissingen adequate informatie over audiovisuele instructie op te stellen. Twee aspecten zijn onder meer belangrijk: leereffectiviteit en de kosten. De hoge kosten ten behoeve van een audiovisueel instructieprogramma zijn gerechtvaardigd, wanneer een instructieprogramma door veel studenten in een omschreven (beperkte) tijdsspanne kan worden gezien.

Hoofdstuk 4 - Een onderzoek naar de beschikbaarheid en het gebruik in Nederland van audiovisuele onderwijsprogramma's ten behoeve van de oncologie, 1983

In de Amerikaanse Cancer Education Survey was naar voren gekomen dat onder medische docenten wel degelijk belangstelling bestond voor audiovisuele medische onderwijsprogramma's. De indruk bestond echter wel dat er een tekort was aan professioneel ontworpen audiovisuele onderwijsprogramma's over oncologische onderwerpen. De noodzaak tot het ontwikkelen van meer en betere audiovisuele oncologische onderwijsprogramma's werd in 1979 in de Survey genoteerd.
In het enquête-onderzoek dat aan de Nederlandse Medische Faculteiten met betrekking tot het onderwijs in de oncologie werd gehouden (hoofdstuk 2), was een aantal vragen opgenomen die een indruk verschaffen over de beschikbaarheid en het gebruik van audiovisueel onderwijsmateriaal over oncologische onderwerpen in eigen land. Uit het onderzoek kwam naar voren dat in een aantal medische faculteiten centrale mediatheken waren, maar dat daar door medische faculteitsleden niet in alle gevallen optimaal gebruik van werd gemaakt. Op het gebied van de oncologie kenden de faculteitsleden weinig audiovisuele produkties; het meest bekend waren de programma's van het K.W.F. Onderwijsproject Oncologie. Een aantal faculteitsleden adviseerde (in 1983) tot produktie van meer audiovisuele oncologische onderwijsprogramma's; door een aantal andere faculteitsleden werd informatie gevraagd over het bestaan van dergelijke programma's.

Hoofdstuk 5 - Het K.W.F. Onderwijsproject Oncologie

Het K.W.F. Onderwijsproject Oncologie is een landelijk project, gefinancierd door de Stichting Koningin Wilhelmina Fonds. Het Project produceert audiovisuele onderwijsprogramma's over oncologische onderwerpen, waarbij de teksten worden ontworpen in multidisciplinair en multi-institutioneel verband. De medische inhoud van de programma's beperkt zich tot noodzakelijke basiskennis over oncologische onderwerpen voor artsen. De programma's kunnen op tweeërlei wijze worden gebruikt.

1 - Voor zelf-instructie, waarmee de gelegenheid bestaat om in ongeveer een half uur tijd multidisciplinair belichte basiskennis te verwerven over een bepaald oncologisch onderwerp.
2 - Als hulpmiddel voor klinische docenten, zoals chirurgen, radiotherapeuten, internisten en patholoog-anatomen. Dezen kunnen in hun colleges uitgaan van de in het programma aangeboden multidisciplinaire basiskennis. Op deze wijze kunnen in een multidisciplinair oncologisch onderwijscurriculum onnodige herhalingen en fouten worden voorkomen.

Bij de produktie van een multidisciplinair en multi-institutioneel audiovisueel onderwijsprogramma ontstaan bepaalde problemen. Dit heeft geleid tot het ontwerpen van een bijzondere produktiewijze. Hierover wordt gedetailleerd verslag gedaan.

Hoofdstuk 6 – Een onderzoek naar doelgroepen voor de programma's van het K.W.F. Onderwijsproject Oncologie

Sinds 1981 zijn de produkties van het K.W.F. Onderwijsproject Oncologie op diverse wijzen geëvalueerd. Nadat de eerste studie naar de kwaliteit was voltooid, volgden drie studies naar leereffecten; de eerste naar leereffecten op korte termijn, de tweede naar leereffecten op langere termijn, de derde naar de invloed van de onderzoeksituatie op leereffecten.
Het onderzoek dat in dit hoofdstuk nader wordt besproken, heeft ook aangetoond dat eenzelfde programma voor verschillende doelgroepen uitstekend kon worden gebruikt. Dit bleek te gelden voor medische studenten, huisartsen, medische specialisten, radiotherapielaboranten, verpleegkundigen, paramedici, tandheelkundige studenten, voor hen die fundamenteel onderzoek verrichten, en ook voor leken.

Conclusies

- Het onderwijs in de oncologie dient het multidisciplinaire karakter van de oncologie te weerspiegelen.

- Effectieve oncologische onderwijsprogramma's zijn alleen mogelijk door goede coördinatie in een multidisciplinair oncologiecurriculum.

- Om docenten in een multidisciplinair oncologiecurriculum de mogelijkheid te bieden de eigen expertise zo goed mogelijk te belichten, dient naar wegen te worden gezocht om onnodige herhalingen en fouten in de kennisoverdracht te voorkomen.

- Audiovisuele oncologische onderwijsprogramma's met multidisciplinaire basiskennis kunnen in ongeveer een half uur tijd adequate kennis verschaffen over een bepaald oncologisch onderwerp. Deze programma's kunnen door verschillende doelgroepen worden gebruikt.

APPENDIX A

A REVIEW OF SELECTED OUTCOMES FROM THE U.S. CANCER EDUCATION SURVEY, 1976-1979

CONTENTS

APPENDIX A – SECTION 1

INTRODUCTION AND ACKNOWLEDGEMENT

In the following review a majority of important outcomes from the U.S. Cancer Education Survey is abstracted by the investigator of the Dutch Study.
The objective of introducing a quite extensive review of the U.S. Survey in this Appendix is to provide an opportunity for Deans and Faculty Members of the medical schools and for other persons who might be interested in cancer education programs, to get an overall impression of the extensive U.S. Cancer Education Survey. Such an impression will be helpful when medical faculties consider to innovate their teaching efforts in cancer.
The general outline that has been followed is:

- Survey design
- Institutional characteristics
- Cancer education faculty members, activities and attitudes
- Medical students and cancer education.

The review is completed with the U.S. Conclusions and Recommendations concerning Student Cancer Education (1981).

Because this review of selected outcomes from the U.S. Cancer Education Survey is an authorized abstract from the Survey reports, and because no discussions from the investigator of the Dutch Study are introduced, it was decided to use the seal of the American Association for Cancer Education on every page in this Appendix, indicating that the text refers to the official U.S. Cancer Education Survey Reports.*

The U.S. Cancer Education Survey Reports can be obtained from:
Division of Resources, Centers, and Community Activities.
National Cancer Institute
Blair Building – 624
Bethesda, Maryland 20205
U.S.A.

Vol. I - Institutional Educational Resources for Cancer Education in

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*The writer wants to thank Dr. Frederick Peagler, D.D.S., President of the American Association for Cancer Education (1984), for his kind permission to follow the suggested procedure and to use the seal of the A.A.C.E.

United States Medical Schools.
DHHS Publication No. 81-2255 - January 1981.

Vol. II - Institutional Educational Resources for Cancer Education in United States Dental Schools.
DHHS Publication No. 81-2256 - January 1981.
- Data from Volume II have not been used in detail in the following abstract. However, general outcomes from Volume II are included in Volume VI.

Vol. III - Cancer Faculty in United States Medical Schools.
DHHS Publication No. 81-2257 - January 1981.

Vol. IV - Medical Students and Cancer Education in United States Medical Schools.
DHHS Publication No. 81-2258 - January 1981.

Vol. V - Summary of Observations made during Institutional visits in 44 United States Medical Schools.
DHHS Publication No. 81-2259 - January 1981.

Vol. VI - Final Report: Cancer Education in United States Medical and Dental Schools.
DHHS Publication No. 81-2260 - January 1981.

APPENDIX A – SECTION 2

SURVEY DESIGN

A.2.1 ORGANIZATIONAL STRUCTURE OF THE U.S. CANCER EDUCATION SURVEY

A.2.1.1 Organizational structure

The organizational structure of the U.S. Cancer Education Survey (Fig. 6, page 146) was based on a desire to involve relevant experts in the design and implementation of the Survey.

A.2.1.2 American Association for Cancer Education (AACE)

The American Association for Cancer Education (AACE) provided the majority of professionals engaged in this activity, with appropriate liaison and consultation provided by officials of the National Cancer Institute and certain other organizations such as the:

- Association of American Medical Colleges
- American Association of Colleges of Osteopathic Medicine
- American Association of Dental Colleges.

A.2.1.3 Supervisory Committee

The Supervisory Committee* was responsible for directing the policy under which the Survey operated. In addition, all members of the Committee served as Associate Principal Investigators throughout the duration of the Survey. The Committee supervised and approved the methodology used in the Survey, including

- survey design
- questionnaires
- procedures for ensuring confidentiality
- techniques of data collection.

*See page 147.

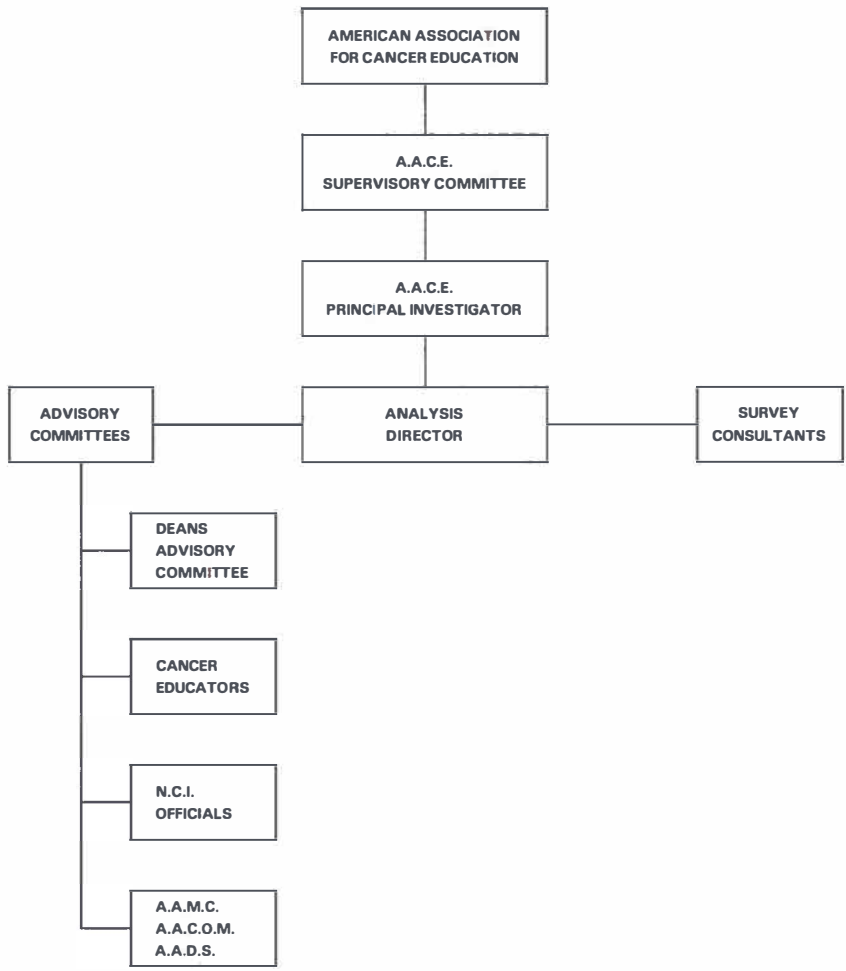

Fig. 6. Organizational structure of the U.S. Cancer Education Survey. (A.A.C.E.: American Association for Cancer Education; N.C.I.: National Cancer Institute; A.A.M.C.: Association of American Medical Colleges; A.A.C.O.M.: American Association of Colleges of Osteopathic Medicine; A.A.D.S.: American Association of Dental Schools)

A.2.1.4 **Principal Investigator**

A member of the Supervisory Committee was selected to serve as Principal Investigator for the Survey. His functions were:

- to supervise all Survey activities, including coordination and liaison of the AACE efforts with the subcontracting Survey Consultants Firm
- to aid in selection of the members of the Advisory Committees
- to coordinate relations with the National Cancer Institute
- to coordinate (and conduct a majority of) the Institutional Visits
- to coordinate the preparation of all reports.

The Principal Investigator worked in close cooperation with the Analysis Director.

A.2.1.5 **Analysis Director**

Activities for which the Analysis Director** was responsible included

- re-drafting of questionnaires for final Office of Management and Budget approval
- specification of the sampling design
- survey implementation
- supervision of data collection and data processing activities

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*Members of the U.S. Supervisory Committee were:

Richard F. Bakemeier, M.D. (Principal Investigator), Professor of Oncology in Medicine and Associate Director, University of Rochester Cancer Center, University of Rochester School of Medicine (N.Y.).

L. Raymond Hall, D.O., Professor of Oncology, Kansas City College of Osteopathic Medicine.

Susan J. Mellette, M.D., Professor of Medicine, Medical Oncology Division, Medical College of Virginia.

Arthur S. Miller, D.D.S., Professor and Chairman, Department of Pathology, Temple University School of Dentistry.

Peter J. Mozden, M.D., Professor of Surgery, Boston University School of Medicine.

V. K. Vaitkevicius, M.D., Professor and Chairman, Department of Oncology, Wayne State University School of Medicine.

David A. Wood, M.D., Professor of Pathology (Oncology), (Emeritus). Director Emeritus Cancer Research Institute, University of California at San Francisco.

**John Deegan, Jr., Ph.D., Assistant Professor of Political Science University of Rochester, N.Y.; Faculty Research Associate, University of Rochester Cancer Center (N.Y.).

- direction of data analysis activities
- participation in the preparation of all reports.

A.2.1.6 **Advisory Committees**

In Advisory Committees a large number of professionals, representative of most oncologic subspecialties, were involved in the Survey. These professionals served in an advisory capacity to the Principal Investigator, to the Supervisory Committee, to the Survey Consultants, and they participated in the Institutional Visits.

A.2.1.7 **Cancer Educators**

Cancer Educators involved represented diversified expertise and geographical dispersion, and possessed acknowledged national reputations as cancer educators. Some of the specific functions performed by these professionals included:

- assistance in the construction and testing of questionnaires
- assistance in the establishment of priorities in data analysis
- assistance in providing access to educational institutions
- assistance in reviewing data as they became available.

A.2.1.8 **Deans Advisory Committee**

The Deans Advisory Committee consisted of Deans of 15 medical, dental and osteopathic schools. The Deans serving in the Committee were selected on the basis of their acknowledged interest in cancer education activities. The Committee assumed the responsibility of facilitating cooperation between the Survey and Dean's Offices in the various professional schools. This Committee also reviewed drafts of the questionnaires.

A.2.1.9 **Survey Consultants Firm**

A Survey Consultants Firm* was employed to provide the expertise and

*Black and Regenstreif Associates. President: Gordon S. Black, Ph.D.

resources necessary for the Survey. The Consultants were selected on the basis of their familiarity with educational activities and their extensive experience in survey research. They were:

- to collaborate in the design of the Survey
- to coordinate the implementation of the Survey
- to perform statistical analysis of the data
- to assist the Principal Investigator and Supervisory Committee in preparing the reports on the findings of the Survey.

A.2.2 DATA COLLECTION INSTRUMENTS

A.2.2.1 **Data collection instruments**

In the U.S. Survey four data collection instruments were designed:

1 - Educational Resources Questionnaire (ERQ) for medical and osteopathic schools.
2 - Educational Resources Questionnaire (ERQ) for dental schools.
3 - Faculty and Curriculum Questionnaire (FCQ) for medical and osteopathic schools.
4 - Student Questionnaire (SQ) for medical and osteopathic schools.

The aim was to acquire data on the following characteristics of professional schools relevant to student cancer education:

- Administrative structure
- Physical facilities
- Faculty resources and attitudes
- Curriculum design
- Student perceptions of the cancer curriculum and their attitudes toward cancer patient care.

In the current overview on outcomes of the Cancer Education Survey the results on the ERQ for dental schools will not be discussed.

A.2.2.2 **Designated Representatives**

With the support of the Deans Advisory Committee, the Dean's Offices of all U.S. medical, dental and osteopathic schools were contacted in fall 1975, and were asked to nominate a faculty member involved in their school's

Cancer Education Program, who would thereafter serve as that Institution's Designated Representative to the Cancer Education Survey, and to supervise completion of the institutional questionnaires.

A.2.2.3 **Development and testing of the data collection instruments**

Construction of the ERQ, FCQ and SQ for medical schools involved consultations between the Project Staff, Supervising Committee, Advisory Committees and the Survey Consultants Firm.
Testing of the ERQ was carried out with the help of the Designated Representatives from 26 participating schools.
The FCQ was pretested on 23 faculty members (representing all the oncologic subspecialties) from 10 schools. As a result of the pretest a number of modifications concerning content, question wording and question sequencing were incorporated into the final version of the instrument.
The SQ was pretested on a total of 57 students from 3 medical schools. As a result of the pretest a number of modifications were made to the instrument concerning content, question wording and question sequencing. Preclinical (second year) and clinical (fourth year) medical students participated in this phase of the Survey.

A.2.2.4 **Response rates for the data collection instruments**

Of all 114 operational U.S. medical schools in existence at the initiation of the Survey in 1975, a total of 110 medical schools participated in the *ERQ phase of the Survey.*
Ninety-five of the 110 schools participated in the *FCQ phase of the Survey.* Since it was not possible to identify the specific specialties and subspecialties involved in cancer related teaching at each participating institution, and because the unknown size of these faculties, it was decided by the Supervisory Committee that all faculty members enumerated by the Designated Representatives should be surveyed. The Designated Representatives provided a list of faculty members actively participating in the cancer education activities of any department within their institutions.
The referral procedure employed resulted in a list of 2450 cancer faculty members at 95 medical schools. The number of completed usable responses from these 2450 faculty members totalled 1311, for an overall response rate of 54% representing 83% of U.S. medical schools.

Ninety-five of the 110 schools participated in the *SQ phase of the Survey*. Student sampling was performed by sending questionnaires to a random sample of 25% of the students just completing their preclinical courses, and to 25% of the students scheduled to graduate in approximately six months in each school.
The sampling design of the Survey resulted in a preclinical students list of 3105 medical students, and a clinical students list of 2971 medical students at 95 medical schools.
The number of completed responses from the preclinical students totalled 1861 for an overall response rate of 60%; the completed responses from the clinical students totalled 1757 for an overall response rate of 59%.

A.2.2.5 **Institutional Visits**

Institutional Visits (A.2.4) were made to 44 of the 110 participating medical schools to document further some of the information obtained from the questionnaire data.

A.2.2.6 **Statistical analysis**

Statistical analysis, including multiple-regression analysis, were applied to the data to clarify important determinants of effectiveness of cancer education.

A.2.3 CONTENT OF THE U.S. QUESTIONNAIRES

A.2.3.1 **Content of the Educational Resources Questionnaire**

Information obtained from the Medical Educational Resources Questionnaire included the following topics:

1 - The existence of Cancer Centers (and their NCI status) and Departments of Oncology.
2 - The existence of Oncology Units within individual departments.
3 - Institutional cancer education structures such as Cancer Education Committees.
4 - The existence and characteristics of cancer patient facilities.

5 - The availability and extent of postdoctoral oncology fellowships.
6 - The existence and extent of financial support for students specifically for cancer education.
7 - The existence and frequency of regularly scheduled seminars and conferences on cancer for faculty members and students.
8 - The existence and frequency of special cancer symposia.
9 - The existence and usage of tumor registries by students.
10 - The existence and usage of outpatient facilities for oncology instruction.
11 - The existence and usage of interdisciplinary treatment planning conferences for educational purposes.
12 - The existence and usage of specialty treatment planning conferences for educational purposes.
13 - The existence and extent of psychosocial instruction related to cancer.
14 - The existence of programs in Continuing Cancer Education.
15 - The existence of cancer related educational programs for paramedical personnel and the public.
16 - The names of key faculty members in the cancer education program.
17 - A description of anticipated changes in the institution's cancer education program.

A.2.3.2 **Validating the U.S. Educational Resources Questionnaires data**

In the U.S. Survey the obtained data were checked for accuracy by cross validating recorded data with other sources of information, for example:

- data published in the Journal of the American Medical Association
- data appearing in other sources such as the Journal of Medical Education
- data obtained from other individuals at selected schools
- Institutional Visits data gathered from Visits to 44 of the 110 participating medical schools in 1976, 1977 and 1978.

In addition, the internal validity of responses was examined through the use of special purpose computer routines written to detect response inconsistencies.

The evaluation revealed that there were generally few problems with the data. Those problems that were discovered typically occurred as a result of imprecise question wording in the survey instrument.

Other forms of errors detected (that is, errors not of an inconsistent form) were found to have typically resulted from a respondent who misperceived the actual level of cancer education activities at his or her institution, usually due to being either unfamiliar with specific aspects of the program, or from having adopted an inappropriate (i.a. a too narrow, or too broad) perspective, and reporting inaccurate information.
Numerous efforts to validate the Educational Resources Questionnaire data resulted in the elimination of all known inaccuracies.

A.2.3.3 **Content of the U.S. Faculty and Curriculum Questionnaire**

Information obtained from the Faculty and Curriculum Questionnaire included the following topics:

1 - Departmental affiliation of the respondent.
2 - A description of research and teaching efforts, and of patient care responsibilities.
3 - Expectations (over the next 5 years) concerning the individual's cancer education, research and patient care activities.
4 - A listing of cancer teaching activities, including both course titles and subject matter content, special lectures, clerkships, and electives.
5 - The respondent's participation in teaching about cancer treatment modalities.
6 - The use of audiovisual aids and computers in teaching.
7 - Desired improvements in audiovisual aids, and suggestions concerning needed new teaching materials.
8 - Expectations and preferences for reapportioning curricular time and budgets devoted to cancer education.
9 - Attitudes concerning the amount of cancer education in the curriculum, and regarding whether or not a cancer curriculum should be required of all students.
10 - Identification of the most important improvements needed and deficiencies noted in the cancer related component of the curriculum.
11 - Attitudes toward the cancer related educational programs of: practicing physicians / student nurses / practicing nurses / and the general public.

A.2.3.4 **Validating the Faculty and Curriculum Questionnaire data**

Evaluation efforts engaged in revealed that the data exhibited a high degree of internal and external validity. It is acknowledged, however, that 100% validation of the Faculty and Curriculum Questionnaire data could not be accomplished within the scope of this Survey.

A.2.3.5 **Content of the U.S. Student Questionnaire**

Information obtained from the Student Questionnaire included the following topics:

1 - A demographic profile of students including their age, sex, location of home, education of parents, and previous educational experience.
2 - Exposure to 10 different basic science cancer-related topics, including the curriculum hours devoted to each topic (and the quality of teaching) in required preclinical courses.
3 - Exposure to cancer education in required clerkships, including an evaluation of the quality of teaching.
4 - Exposure to 22 clinical cancer-related topics, including the curriculum hours devoted to each topic.
5 - Exposure to patients with cancer, including the number of patients having each of 14 different cancer diagnoses.
6 - Exposure to 12 diagnostic or therapeutic procedures, including an indication of whether the emphasis in teaching was on cancer and an indication of the intensity of the exposure to the procedure.
7 - Exposure to 6 different treatment modalities for cancer in general, including indications of how the student was taught about the treatment modality.
8 - Exposure to 7 different treatment modalities for breast carcinoma, including the number of patients that the student saw in treatment.
9 - Awareness of and utilization of multidisciplinary treatment-planning conferences and tumor registries.
10 - Extent and location of exposure to teaching about psychosocial problems of cancer patients.
11 - Exposure to cancer-related material by hours in preclinical or clinical electives, and summer fellowships, including the expo-

sure to cancer patients in these electives; whether the student conducted research in the electives on cancer; and an evaluation of how well the subject was taught.

12 - Students' attitudes concerning the areas of cancer education in which more time should be devoted, including open-ended requests for suggestions of improvements that might be made in the cancer curriculum.

13 - Knowledge of the organizational structure of cancer education in the particular institution, including whether the student was aware of the existence of a Cancer Education Committee and a Cancer Education Coordinator.

14 - Students' attitudes toward appropriate treatment of cancer patients under a variety of circumstances and toward patients' reactions to their cancers.

15 - Attitudes toward different modes of medical practice, including evaluation of the factors that may have influenced the student's choice of a mode of practice. (For both second and fourth year students.)

16 - An evaluation of the attractiveness of different areas of clinical specialization, including the factors that may have influenced the student's evaluation of these specialities. (For the fourth year students only.)

A.2.3.6 **Validating the Student Questionnaire data**

Due to the fact that a mail survey technique was employed for student data collection purposes, and questionnaires were returned anonymously, it was impossible to validate individual returns. Returns were aggregated by school, however, and specific items dealing with student characteristics were compared to relevant institutional data appearing in publications such as the

- Journal of Medical Education
- Journal of the American Medical Association.

In addition, individual level analyses were performed comparing individual student attributes with comparable medical student census data appearing in the Journal of Medical Education. The obtained medical student sample data was found to be representative of the U.S. medical students both at the national (aggregated) level and at the institutional level.

A.2.4 METHODOLOGY OF THE INSTITUTIONAL VISITS

Institutional Visits were made to 44 U.S. medical schools between April 1976 and January 1978 under the direction of the Cancer Education Survey.

A.2.4.1 Selection of Institutions

The selection on the medical schools to be visited involved several key factors, and was not a random sample. A list of schools was made which included:

- schools in all general regions of the country
- schools in the largest cities and schools in small cities
- schools ranging widely in class size
- schools founded within the past 5 years and older schools
- state-affiliated schools and private schools
- schools associated with NCI cancer centers or with other types of cancer research institutes, or with neither
- schools which currently (1976-78) possessed an NCI Cancer Education Grant (implying a relatively high level of student cancer education activity)
- schools which had possessed an NCI Clinical Cancer Training Grant in the past but did not currently have a grant
- schools which had never possessed either type of grant.

A.2.4.2 Format of the Institutional Visits

Each Visit was arranged through the institution's Dean's Office and a Designated Representative representing the Dean's Office. Most Visits occurred on a morning and afternoon of one day.

Two representatives of the AACE attended each Visit. These representatives consisted of a broad range of cancer educators. There were 13 surgeons, 7 medical oncologists, 4 radiation oncologists, 2 pediatrician oncologists, and 2 pathologists involved in the 44 Visits. Consistency in observations was sought by having each representative visit several schools.

A representative of the Survey Consultants Firm attended most of the Visits. Meetings were held with:

- the Dean or his representative
- the Cancer Education Program Director and Cancer Education Committee (if such existed)

- a group of clinical faculty members
- a group of second and fourth year students.

Each visitor subsequently wrote a confidential report of his/her observations, using the following topic headings:

I - Administration
II - Cancer Education Program Director
III - Cancer Education Committee
IV - Cancer education activities
V - Faculty members
VI - Students
VII - Cancer patients
VIII - External Resources and Programs
IX - Some general concluding observations.

The accumulated reports written by these representatives were reviewed by a subcommittee.

A.2.4.3 **Question quidelines for exploring cancer education programs**

The general Interview guidelines used during the Institional Visits were as follows.

Administration

A - What is the attitude of the Dean with regard to the general place of cancer education in the curriculum of the medical school?
B - How much administrative support exists for the cancer education program, including faculty recruitment and facilities?
C - What kind of mechanisms exist for facilitating interdisciplinary cooperation in the development, planning, and funding of cancer education?
D - What appears to be the relationship and access of the Cancer Education Committee, if any, the Program Director, if any, and other relevant cancer faculty member to the Dean of the school?

Cancer Education Program Director

A - Is there a single individual who appears to be predominantly responsible for the cancer education curriculum and program at the school?
B - Could you describe the velocity and objectives of those involved in directing the development of a cancer education curriculum and program?
C - How do the administrative people and faculty people assigned responsibility for the development of the cancer program view their own program in terms of its development, status, and need for change?
D - What kind of cooperation and rapport seem to exist between those responsible for the cancer education program and the chairmen of the various departments?

Cancer Education Committee

A - Does the school have a Cancer Education Committee and, if it does, what are this Committee's responsibilities?
B - How active is the Committee – does it have regular meetings, does it have an agenda, is it responsible for specific development plans, etc.?
C - Is the Cancer Education Committee composed of people from both basic sciences and the clinical sciences?
D - What is the access of the Committee to the Dean and to the General Curriculum Committee of the school?
E - Does the Cancer Education Committee have any specific evaluation procedures for examining its own cancer education program?

Cancer education activities

A - Could you describe the general characteristics of the curriculum at the medical school, including any characteristics of the general curriculum that would constrain or otherwise limit the development of a core curriculum in Oncology?
B - Is there a defined core curriculum in Oncology, and what is the

nature of that curriculum?

C - What is the availability of Oncology electives in the basic sciences and in the clinical sciences?

D - What are the strenghts and weaknesses of the curriculum in Oncology, both from the point of view of students wishing to specialize in Oncology, and from the point of view of the regular medical student who does not specialize in Oncology?

E - What do you see are the main problems that exist in this school's curriculum

F - What is the availability to students of multidisciplinary treatment planning conferences, seminars, guest lectures, or departmental conferences on cancer topics?

G - Could you indicate whether or not there exists any lectures/ conferences or clerkships on the following topics: cancer prevention / carcinogenesis / cancer epidemiology / cancer detection / psychosocial aspects of cancer / cancer rehabilitation / radiation therapy / surgery/ chemotherapy / immunotherapy.

H - What and how much of the curriculum of cancer education is required of all medical students?

Faculty members

A - What do you perceive to be the interest of the faculty members you are interviewing in cancer education?

B - What are the objectives of these faculty members with regard to cancer education activities; in particular, are their objectives the same or are they different?

C - Are clinical faculty members used to teach cancer oriented units in the basic sciences courses?

D - Are there people who specialize in Oncology in every department, or are there some departments which tend not to have people who specialize in Oncology?

E - Can you obtain the names of key people in the area of Oncology for the following departments: Biochemistry, Pharmacology, Pathology, Microbiology, Immunology, Internal Medicine, Surgery, Pediatrics, Obstetrics/Gynecology, and Radiation Oncology?

F - To what extent are interns and residents used as part of the basic teaching program in Oncology?

Students

A – What are the perceptions of and feelings about the cancer education program and cancer among students?
B – What do students perceive to be their access to faculty members and facilities in the area of cancer education?
C – What do the students know about the regular elective opportunities in cancer education and the summer opportunities for cancer specialization either in research or in clinical work?
D – Are students allowed to participate in cancer research projects in the basic sciences and clinical sciences?
E – What are the available facilities for student research, particularly labs, space, and equipment?
F – What suggestions for change do students have with regard to the curriculum for cancer?
G – What are the various information sources for students, including a Tumor Registry, library facilities and audiovisual facilities?

Cancer patients

A – Are there cancer clinics that are used for patients on an outpatient basis, and what are these clinics?
B – Are cancer patients centralized in particular areas of the hospital or are they dispersed throughout the hospital?
C – To what extent are patients available to medical students?
D – What is the access of students at the school to patients at other hospitals?
E – What is the exposure of students to patient cases in Tumor Boards or in treatment planning conferences?

External Resources and Programs

A – Are there affiliated teaching hospitals with specialized cancer facilities, and, if there are, what is the access of students in the medical school program to these teaching hospitals?
B – Are there joint cancer projects or progams between several medical schools that are available to students?

C - What kind of programs exist for continuing education for physicians in the community or in the surrounding area?
D - What kind of programs exist for public information and education on cancer?
E - To what extent is there a commitment to continuing education and public information as exhibited through the allocation of resources and personnel?

Some general concluding observations

A - What is the extent and nature of interdisciplinary cooperation in the planning, conduct and structure of the cancer education program?
B - How would you describe the extent and nature of the opportunities that exist for students, who desire it, to acquire a specialized understanding of Oncology?
C - What is the general extent and nature of the exposure of the ordinary, non-specialized student to cancer educational materials in the curriculum?
D - What are the controversies, if any, within the institution about cancer education; e.g., the question of centralizing the program, the reaction of various departments to a special program in cancer education, etc.?

APPENDIX A – SECTION 3

MEDICAL SCHOOL CHARACTERISTICS

A.3.1 GENERAL ASPECTS OF U.S. MEDICAL SCHOOL CURRICULA

The 'traditional' medical schools curriculum consists of a four year program with instruction organized on a departmental basis. This four year program of study is usually entered after a student has completed three or four years of preparatory work in the biological and physical sciences and liberal arts, which typically culminates in an university- or college-granted Bachelor's Degree.

In a 'traditional' medical curriculum, the first two years are ordinarily devoted to instruction in the basic biomedical sciences (biochemistry, gross anatomy and histology, physiology, microbiology, pathology and pharmacology).

Courses providing an introduction to clinical medicine are sometimes also included in the first two years, and involve training in physical diagnosis, patient interviewing, and discussions of basic science information in the context of clinical problems.

The third year of a 'traditional' medical curriculum consists of a series of 4 to 12 week clinical clerkships devoted to internal medicine, general surgery and surgical subspecialties, pediatrics, gynecology and obstetrics, and psychiatry.

The final year of the program sometimes repeats a number of these assignments at a more advanced level of instruction and with more patient care responsibility; but in most medical schools this year is 'selective' or 'elective' in nature. The student is required to select from a list of available opportunities ('selectives') and/or is allowed to plan an 'elective' period with options of his own choosing. These experiences represent a variety of disciplines, including oncologic specialties, either at the student's own school or at other schools whose program has received approval from the Dean's Office.

'Non-traditional' or innovative medical curricula include a variety of programs such as three-year curricula, or four years with one year of basic biomedical science followed by three years which are generally clinical in nature.

These two variations often lead to an abridgment of basic biomedical science instruction with preservation or expansion of clinical training.
Another curricular variation reverses part of the traditional sequence of education, with a portion of the basic science education being delayed until one or the other of the final two years.
A common curricular variant involves instruction on an organ system basis, most often occurring during the second year, but in some schools extending throughout the first two years.
Traditional departmental teaching responsibilities (e.g. biochemistry, physiology, anatomy) are integrated so that departmental courses, as such, may not exist. For example, several departments may collaborate in presenting the respiratory system or the cardiovascular system, both in reference to its normal function and to its pathophysiology.

The cooperating medical schools in the U.S. Cancer Education Survey consisted of 110 schools of medicine granting the degree of Doctor of Medicine (M.D.), and 8 colleges of osteopathic medicine which grant the degree of Doctor of Osteopathy (D.O.). These two groups of schools have similar curricula and teach essentially the same material.
Colleges of osteopathic medicine, in general, have

- a larger emphasis on education of family practitioners
- somewhat larger student/full time faculty ratios
- smaller research programs than do the other schools.

In the U.S. Survey in 1975 seventy-two of the 110 participating medical schools indicated their curriculum is 'traditional' in structure. Thirty-eight had a variety of innovative curricula.

A.3.2 MEDICAL SCHOOL ADMINISTRATIVE STRUCTURE AND CANCER EDUCATION

A.3.2.1 Deans

Most of the information concerning the role of the Dean's Office in cancer education programs came from interviews with 32 Deans or Vice Presidents during 44 Institutional Visits. These interviews were usually informative and sometimes led to significant changes in a school, such as appointment of a new Cancer Education Committee or appointment of a new cancer program representative to the Curriculum Committee.

It should be remembered that medical school Deans are recruited from all branches of biomedical sciences and education, and that many Deans may have had little contact with cancer education, research, or clinical care prior to assuming their administrative responsibilities. Therefore, a more important factor affecting the emphasis on cancer education in a school than the role of the Dean may be the importance which the faculty members place on cancer in general, including research, patient care, and post-doctoral training.

Deans were occasionally found to be actively promoting the expansion of their school's cancer program, at times in conjunction with the availability of a Cancer Center Grant or Cancer Education Grant. However, in two-thirds of the institutions visited, Deans seemed to be responding to faculty pressure for expansion of cancer programs rather than initiating that expansion. In such instances, three sources of concern were expressed by Deans:

1 - The expansion of a categorical program in one field such as cancer was considered a potential threat to the balanced growth of the institution's programs, leading to pressure from other areas to expand beyond sound fiscal limits.

2 - Establishment of a large cancer program based primarily on grant support raised concern because of uncertainty of long-term support.

3 - Deans of relatively new schools felt that their school's priorities mandated the development of more fundamental educational programs before large commitments were made to specific fields such as cancer.

Cancer education was recognized by nearly all Deans to require interdepartmental coordination. The mechanism for this in most schools was a Cancer Education Coordinator (in 75 of 110 schools) and a Cancer Education Committee (in 92 of 110 schools). These entities had the potential of providing the Dean's Office with an overview of cancer education needs which are helpful in coordinating the decisions of individual departments.

Finally, it should be noted that the effect on cancer education programs of the Dean in some medical schools is limited because of the relatively short tenure of many Deans. Continuing growth of cancer programs in those instances depends less on the Dean's role than on the leadership of faculty members such as a Cancer Education Coordinator.

A.3.2.2 **Cancer Education Coordinator or Program Director**

The objectives of a Cancer Education Coordinator or Program Director vary with the needs of a particular school. Fundamentally, they revolve around stimulating and facilitating departmental and interdepartmental cancer education. Seventy-five of the 110 medical schools reported having such a coordinator. These individuals varied considerably in their effectiveness. Most coordinators of successful cancer education programs were observed during Institutional Visits to possess the following characteristics:

1 - Well informed in most fields of Oncology, including basic sciences and clinical medicine.
2 - Recognized by associates as having expertise in his primary field of interest, and as being an innovative leader in cancer education.
3 - Dedicated to a multidisciplinary approach in cancer teaching.
4 - Acquainted with key cancer-related faculty members at both the basic science and clinical levels.
5 - Acceptable to the power structure in the institution, and not a threat to the established divisions of patient care and research responsibilities. (Interdepartmental educational activities were observed to facilitate cooperation between units and individuals in a cancer program who otherwise might compete at the level of patient care and research.)
6 - Have ready access to the:
    a - Dean's Office
    b - Curriculum Committee

Most Cancer Education Coordinators in the United States were categorized in Medical Oncology and Surgical Oncology. The discipline with which a Coordinator is identified is of secondary importance to his/her recognition as a respected authority in that field.

Other sources of influence include the support of the Dean, Cancer Center Director, or Department of Oncology Chairman. Financial support from a NCI Cancer Education Grant can provide important leverages in obtaining departmental cooperation.

A.3.2.3 **Cancer Education Committee**

Ninety-two of the 110 participating medical schools had appointed a group of faculty members which was termed Cancer Education Committee or its

equivalent. Some had been formed in response to requirements for approval of the institution's cancer program by the American College of Surgeons. Others had been organized primarily to qualify for an NCI Cancer Education Grant.

Ideally there should be a representative on the Cancer Education Committee from each department of the school which is involved in cancer education activities, including basic science departments. Such representatives themselves should be involved in the cancer education activities of their department.

In addition, representatives from nursing, social work, students, associated hospitals, and educationally active agencies such as the American Cancer Society, can broaden the capabilities of a Cancer Education Committee.

The primary responsibilities of a Cancer Education Committee are:

1 - To establish communications between departments involved in cancer education activities.
2 - To establish objectives for the Cancer Education Program.
3 - To facilitate the establishment and conduct of interdepartmental activities, such as a multidisciplinary preclinical cancer course or a clinical lecture series.
4 - To obtain, develop, and dissiminate teaching materials.
5 - To create an 'identity' for the cancer education program and to represent it to the National Cancer Institute and other funding agencies.
6 - To evaluate the program and recommend appropriate changes.

To discharge these responsibilities, an effective Cancer Education Committee should meet at regular intervals, announced well in advance, with a defined agenda distributed prior to the meeting. Specific assignments for individual members make their participation more rewarding and active.

Schools lacking an active Cancer Education Committee were observed to have cancer education programs which were not coordinated. Even major, widely recognized cancer research and patient care programs had relatively little impact on student education in the absence of the coordination, innovation, and evaluation which a Cancer Education Committee can provide.

These functions of a Cancer Education Committee have been recognized by Deans, faculty members, and students during the several phases of the Survey. Since such committees already exist in most schools, the problem at hand appears to be to make them function more effectively.

One means of increasing the impact of a Cancer Education Committee is for one of its members to serve on the Curriculum Committee of the school, and thus to communicate cancer-related educational needs to that more authoritative body.

A.3.3 CANCER EDUCATION PROGRAM CHARACTERISTICS

A.3.3.1 Educational environments and education program content

Cancer education program characteristics can be divided in two groups:

a - Institutional educational *environments*
b — Student cancer education program *content.*

ad a. Positive environmental attributes to student cancer education programs include:

1 - The availability of large numbers of cancer patients to the student cancer education programs, including inpatients, outpatients, and patients in affiliated hospitals.
2 - The presence in the institution of a broad variety of
- Patient care services, such as oncologic outpatient clinics (including screening clinics)
- Designated cancer inpatient beds
- Interdisciplinary treatment planning conferences

3 - The presence of multiple levels of cancer education, including those for residents, post-doctoral fellows, participating physicians, paramedical personnel, and cancer education programs for the public.

ad b. Content characteristics are listed as:

1 - Variety of student cancer education opportunities.
2 - Multidisciplinary cancer education.
3 - Cancer outpatient exposure.
4 - Psychosocial instruction.
5 - Oncologic subspecialty education activities.

A.3.3.2 **Medical students and clinical cancer education environments**

In the traditional medical curriculum, a series of clinical clerkships is taken by students in the third or fourth year, after completion of basic science coursework. The requirement of most medical schools for a 4- to 12-week clerkship in each major clinical specialty presents the potential for exposing the student to all common malignancies, in both localized and advanced stages.

The clinical education process in most schools is based on an assignment of students to a series of individual patients which the student interviews and examines. Appropriate supervision is provided by resident physicians involved in the care of these patients, and by a faculty tutor.

Most medical, surgical and gynecologic services in teaching hospitals have an adequate number of cancer patients (approximately 20-40% of the total patient census) to provide students with a significant exposure to clinical cancer problems. However, despite the adequate numbers of cancer patients on most general medical and surgical wards, clinical clerks in some schools were observed to have a disproportionately meager exposure to modern cancer diagnosis and management techniques. This seemed attributable either to the hospitalized cancer patients being considered (by the clerkship tutors or residents who assigned the patients) too debilitated for suitable involvement in clinical teaching, or to a lack of interest in, and lack of adequate knowledge of, cancer topics by the non-oncologic internists and surgeons who served as tutors.

Students may not even see sufficient numbers of cancer patients because the faculty members and residents may consider such patients unsuitable for clinical teaching. Most students might be exposed to very few patients undergoing active cancer diagnosis and treatment if the patients admitted to areas used for clerkship teaching were primarily advanced or terminal cancer patients.

The potential effects of such a distorted sample of patients in the development of negative student attitudes toward cancer education activities and cancer patient care will be discussed in a forthcoming section 'Possible factors causing negative student attitudes toward cancer' (A.5.5).

Oncology faculty members who actively participated in clerkship teaching reported that many cancer patients were appropriately suited to be involved in effective student teaching exercises, whether situated on specialized oncology wards or on general medical or surgical wards. At least four visited institutions utilized cancer hospitals or oncology wards of general hospitals

for required general internal medicine clerkships, assuring student contact not only with large numbers of cancer patients, but also with oncology faculty members and fellows in training. As a result, a proportion of the students in those schools had extensive exposure to modern concepts of cancer diagnosis and management.

While sequestration of cancer patients was associated at some schools with excellent student learning experiences, Institutional Visitors observed less satisfactory clerkship teaching about cancer in specialized wards at other schools.

A.3.3.3 **Departments of Oncology**

Eight of the 110 participating medical schools indicated the existence of a Department of Oncology. This term implies an administrative unit of a medical school equal in status to a Department of Medicine, Department of Surgery, or other traditional department. These departments vary in their character and are multidisciplinary in their faculty constitution.

Cancer education programs associated with Departments of Oncology have several advantages over programs in other schools, including:

- Representation on department chairmen's committees and on Curriculum Committees
- Control of designated inpatient beds and associated resident physicians
- The possibility of offering a clinical clerkship for students.

Departmental status provides a visible profile for the cancer education and research programs, attracting students, residents and faculty members to them.

A potential disadvantage of this arrangement is the possible sequestration of patients and faculty members from the mainstream of student teaching in the institution, if residents and clerkships are not associated with the patient care activities of the department.

A.3.3.4 **Divisions of Oncology**

Cancer education, patient care and research functions have increasingly been delegated to oncologic subspecialty departments. Most subspecialty divisions are Medical Oncology, Surgical Oncology and Radiation Oncology. Of the 110 participating medical schools, the following numbers of the indicated subspecialty divisions were reported:

Medical Oncology	82
Surgical Oncology	55
Radiation Oncology	54
Gynecologic Oncology	11
Pediatric Oncology	11

The obvious educational advantages of such subspecialty administrative units include:

- Facilitation of faculty member recruitment
- Delegation of categorical teaching activities by the department chairmen to faculty members with expertise in specific areas
- Availability of student elective experiences in oncologic subspecialties
- Facilitation of interdisciplinary teaching activities.

A.3.3.5 **Cancer Centers**

The past decade has seen the emergence of administrative structures termed 'Cancer Centers', many either in or associated with medical schools. These are multidisciplinary organizational structures which seek to integrate and coordinate much of an institution's cancer research and patient care programs.

As of January 1, 1978, the National Cancer Institute had designated

19 comprehensive cancer centers
22 non-comprehensive clinical cancer centers
8 non-comprehensive biological cancer centers

Cancer Centers appeared to have *environmental characteristics* considered potentially advantageous to student cancer education programs, namely:

1 - Availability of cancer patients.
2 - Variety of patient care services.
3 - Other (non-student) levels of education for residents / fellows / practising physicians / nurses / social workers / public.

Cancer Centers administratively integrated into medical schools appeared to have the greatest potential for participation in curricular cancer education activities for medical students. The key figures in the school's cancer education program were, in general, also key figures in the research and patient management programs of the Center.

Centralized clinical care units under the direction of these Cancer Centers served to set standards of excellence in cancer patient care which provided models for the student, if they were exposed to such a unit.

However, of the several indices of cancer education program *content charac-*

teristics, Cancer Centers – not administratively integrated into medical schools – were associated only with the multidisciplinary nature of student cancer education programs, but *not* with a broad variety of student cancer education opportunities, or with student rotations through outpatient facilities. There was a negative association with student psychosocial education, reflecting the observation that programs of cancer psychosocial instruction were reported more frequently by medical schools not associated with Cancer Centers than by those with NCI designated Cancer Centers.

The possible origin of apparent negative effects of Cancer Centers in student cancer education programs were:

1 - Cancer Centers which had developed prior to or independently of the corresponding medical school had staff members who, despite their excellence in their fields, were not active medical school faculty members either by choice or because interpersonal situations involving the medical school administration.

2 - Cancer Centers educational programs were often related closely to research and patient care programs, and emphasized postdoctoral specialty training, both laboratory and clinical. Student teaching was admittedly a deterrant to the primary goals of some Centers and had not been encouraged. This represented an obvious lost opportunity because of the excellence of the faculty members and postdoctoral fellows as potential teachers. The demands of faculty member time for patient service and research left little time for educational activities. In the absence of any system of rewarding educational performances, little incentive existed to develop student programs other than for occasional elective students.

3 - A corollary to the previous point was the relative emphasis by the NCI Cancer Centers Program on research and on continuing medical education rather than on student education. Involvement of Cancer Centers in their respective student education programs appeared to be increasing, however, even during the period of the Cancer Education Survey.

4 - Cancer Centers can affect the cancer patient referral pattern such that nearby academic hospitals may admit few such patients. The sequestration of cancer patients in Cancer Centers seemed to detract from several medical schools cancer education programs according to site visitors.

A.3.3.6 **Specialized clinical cancer investigation wards**

During the Institutional Visits multiple observations of specialized clinical investigation wards were made. These areas often served as models of excellence in cancer medical and nursing care, and presented the most convenient location for teaching psychosocial aspects of oncology. Such wards often created a stimulating environment for student education, especially because they featured:

a - The presence of fairly healthy patients undergoing active, modern, interdisciplinary treatment.

b - Supervision by an enthusiastic group of oncology faculty members and fellows who were skilled clinicians capable of transmitting to students important principles of medicine, pediatrics and surgery as well as oncology.

c - A staff of highly motivated and skilled oncology nurses who were sympathetic to student education needs.

d - An active psychosocial program which could provide guidance and support both for the patients and for the students.

These facilities also gave the hospital residents an opportunity to learn more about cancer and permitted general upgrading of cancer care within the institution.

Such wards generally involved students on an elective basis, thereby reaching only a small percentage of students at some schools. But a few schools used clinical cancer investigation wards for required clinical clerkship assignments, and excellent experiences resulted in several of those schools.

A.3.3.7 **Cancer outpatient facilities**

Approximately two-thirds of the 110 medical schools reported having cancer outpatient facilities through which medical students rotate. Few such student rotations were required, and Institutional Visits repeatedly revealed logistic problems in involving students in outpatient clinics.

Many faculty members recognized that one solution to the need to expose students to patients with more limited stages of cancer was to involve outpatients in the teaching program. However, few schools among those visited apparently had developed satisfactory methods of exposing students to cancer outpatients and therefore had not made the decision to devote adequate clinic time and faculty members to permit effective student teaching in one or more tumor clinics. The main difficulties in attempting to accomplish this

goal lay in the financial and time constraints of busy outpatient clinics and in the rigidity of the medical schools' curricula. The apparent inability of scheduling patients and students to effect satisfactory teaching, and the inability or unwillingness to subsidize the inevitable financial losses of such teaching clinics seemed to be virtually a universal problem.
The situation had been further complicated in many areas by a gradual shift of cancer outpatients to private oncologists' offices outside the teaching centers.

Students who had been involved in outpatient cancer education generally reported a highly informative and encouraging experience which provided their first exposure to active treatment responsive cancer patients.
One highly effective student educational experience with cancer outpatients was described during an Institutional Visit. For the preceding two years a limited number of first-year students at that school (approximately 10) had been offered an elective opportunity to follow two cancer patients with a tutor for up to two years. The student would meet with the patient and tutor during each outpatient clinic visit, and would be informed if the patient required hospitalization during the intervening period. This elective opportunity had become so popular that about half the first-year class were applying in the current year's program. Particularly impressive to supervising faculty members were the positive attitudes acquired by the students toward the possibility of extended, high-quality survival for cancer patients.

A.3.4 SUMMARY OF INSTITUTIONAL CHARACTERISTICS

Consideration of characteristics of medical schools which relate to undergraduate cancer education programs, has led to the following conclusions concerning factors *favorable* and *unfavorable* to the development of effective student cancer education.

A.3.4.1 **Favorable institutional characteristics**

1 - A four-year curriculum, with relative flexibility in planning and sufficient vacation and elective periods to encourage a broad variety of cancer experiences, both curricular and extracurricular.
2 - A disease-oriented educational curriculum (in contrast to a

departmentalized traditional curriculum, or an organ system curriculum), permitting a multidisciplinary cancer course or section of a course during preclinical years.

3 - An integrated tumor biology course (often in the second year), or a clinical cancer course (often in the third or fourth year). These courses should involve all students in a class if possible.

4 - An effective Cancer Education Coordinator and a multidisciplinary Cancer Education Committee with access to a source of funds specifically designated for cancer education activities.

5 - Representation of the Cancer Education Program on the school's Curriculum Committee.

6 - A system of curricular evaluation, with contributions from faculty members and students.

7 - The existence of a mechanism for curricular change permitting innovations when evaluation indicates an unmet need.

8 - A sufficiently large and motivated faculty representing all relevant cancer related basic science and clinical disciplines.

9 - Adequate numbers of cancer patients, both inpatients as well as outpatients, demonstrating both primary and metastatic malignancies, including common neoplasms.

10 - Adequate facilities and paramedical personnel to provide excellent cancer patient care in a manner contributing to productive basic and clinical research.

A.3.4.2 **Unfavorable institutional characteristics**

1 - A three-year curriculum with condensed basic science courses, virtually no vacation periods, and minimal elective periods, which reduces the availability and variety of curricular and extra-curricular cancer experiences.

2 - A rigidly departmentalized curriculum with faculty members exhibiting 'territorial imperatives' and reluctance to participate in interdepartmental, integrative activities.

3 - An organ system curriculum in which cancer-related material is fragmented system by system, thereby complicating the presentation of general principles of cancer pathobiology.

4 - A small, over-committed faculty lacking one or more key oncologic specialists, and whose patient care, research, and other teaching responsibilities preclude expansion of cancer

education activities. (New schools may have these problems.)

5 - Lack of a Cancer Education Coordinator to facilitate innovative multidisciplinary cancer education activities.

6 - The absence of a curricular evaluation system, or of individuals responsible for such evaluation pertaining to cancer education (such as a Cancer Education Committee).

7 - Lack of representation of the Cancer Education Program on the school's Curriculum Committee, or lack of a close working relationship of the Cancer Education Coordinator with the Dean's Office.

8 - Clinical facilities which sequester cancer patients away from sites of required clerkship teaching, or with lack of inpatients with primary common malignancies and/or outpatients with long, generally satisfactory courses.

APPENDIX A – SECTION 4

CANCER EDUCATION FACULTY MEMBERS

A.4.1 EDUCATIONAL ACTIVITIES AND ATTITUDES

A.4.1.1 Introduction

Information from 1311 faculty members in 95 U.S. medical schools constitutes the data base of the results from the U.S. Cancer Education Faculty and Curriculum Questionnaire. The 1311 respondents included 993 members of clinical departments and 111 members of pathology departments, the remaining being faculty members of basic science departments.

In this review of some results from the U.S. Faculty and Curriculum Questionnaire attention is paid especially to clinical and pathology faculty members. In the U.S. Cancer Education Survey pathology department members were separated from the preclinical department faculty members because of those departments' unique role at the interface between the basic sciences and clinical medicine. Thus, the following data relate to 1104 U.S. respondents. Attention is focussed on educational activities and attitudes by cancer education faculty members.

A.4.1.2 Educational activities

Clinical respondents to the U.S. Faculty and Curriculum Questionnaire were categorized by major departmental affiliation. Thus seven main groups were categorized. Furthermore, criteria were employed for classifying faculty respondents as oncologic subspecialists. These criteria were a priori selected, and were based on the respondent's reported percentages of patients having cancer. If the cancer patients for whom the faculty member had responsibility constituted the following designated percentage of his/her total patients, he/she was classified as a Specialty Oncologist.

Surgical Oncology	90%
Medical Oncoloy	90%
Radiation Oncology	90%

Gynecologic Oncology	90%
Pediatric Hematology/Oncology	67%

The (arbitrary) criterion for pediatric oncologists was fixed at a lower percentage of patients having cancer, since hereditary and acquired non-malignant hematologic diseases constitute a significant proportion of clinical responsibility in the Pediatric Hematology/Oncology specialty.
The data are presented in Table 25.

TABLE 25.
MEDICAL FACULTY MEMBERS IN U.S. CANCER EDUCATION SURVEY CATEGORIZED BY MAJOR DEPARTMENTAL AFFILIATION.

Faculty members N = 1104	Specialists[1]	Number of different schools	Oncologists[2]	Number of different schools
Surgery[3]	340	84	30	23
Internal Medicine[4]	312	90	75	44
Radiology[5]	129	69	69	55
Gynecology	58	57	32	31
Pediatrics	63	54	33	32
Pathology	111	73	-	-
Others[6]	91	54	-	-

[1] All specialists.
[2] Specialists, who met the (arbitrary) criterion for classification as Specialty Oncologists (at least 90% of patients had cancer), except Pediatricians (two thirds of patients had cancer).
[3] Includes General Surgery / Urology / Cardiothoracic Surgery / Plastic and Reconstructive Surgery / Neurosurgery / Orthopedic Surgery / Otolaryngology / Pediatric Surgery.
[4] Includes Internal Medicine / Hematology / Pulmonology / Immunology / Gastroenterology / Nefrology / Infectious Diseases / Hepatology / Endocrinology.
[5] Includes Therapeutic Radiology / Diagnostic Radiology.
[6] Includes Dermatology / Neurology / Psychiatry / Medical Psychology / Family Practice / Epidemiology / Ophthalmonology / Rehabilitative Medicine / Others.

In reporting the findings from the U.S. Faculty and Curriculum Questionnaire, the percentages for the responding oncologists will be given, followed by the percentages for the total responding specialty group in parentheses.

Members of each specialty, as a group, devoted the following mean percentages of their teaching to cancer education:

Surgical Oncologists	85% (34%)
Medical Oncologists	87% (39%)
Radiation Oncologists	96% (64%)
Gynecologic Oncologists	90% (75%)
Pediatric Oncologists	64% (49%)
Pathologists	– (42%)

In the next 5 years an increase in time allotted to cancer education was expected by:

Surgical Oncologists	30% (49%)
Medical Oncologists	51% (43%)
Radiation Oncologists	61% (52%)
Gynecologic Oncologists	38% (50%)
Pediatric Oncologists	59% (53%)
Pathologists	– (42%)

In the next 5 years an increase in amount of time devoted to cancer patient care was anticipated by:

Surgical Oncologists	23% (36%)
Medical Oncologists	21% (35%)
Radiation Oncologists	21% (28%)
Gynecologic Oncologists	34% (47%)
Pediatric Oncologists	28% (36%)
Pathologists	– –

A.4.1.3 **Attitudes of cancer education faculty members**

Attitudes of cancer education faculty members can be summarized as follows.

That a cancer curriculum should be required material for all medical students was the opinion of:

Surgical Oncologists	93% (81%)
Medical Oncologists	94% (78%)
Radiation Oncologists	100% (95%)
Gynecologic Oncologists	94% (96%)
Pediatric Oncologists	85% (90%)
Pathologists	– (78%)

That cancer was given too little emphasis in their school's curriculum (1976) was the opinion of:

Surgical Oncologists	43% (38%)
Medical Oncologists	80% (46%)
Radiation Oncologists	74% (65%)
Gynecologic Oncologists	52% (51%)
Pediatric Oncologists	52% (49%)
Pathologists	- (45%)

That their school's amount of cancer education would increase in the next few years was the expectation of:

Surgical Oncologists	96% (99%)
Medical Oncologists	71% (57%)
Radiation Oncologists	98% (99%)
Gynecologic Oncologists	50% (60%)
Pediatric Oncologists	61% (33%)
Pathologists	- (56%)

That cancer education should be primarily conducted by regular academic departments rather than a Cancer Center or Department of Oncology was the opinion of:

Surgical Oncologists	28% (53%)
Medical Oncologists	21% (38%)
Radiation Oncologists	19% (24%)
Gynecologic Oncologists	40% (55%)
Pediatric Oncologists	46% (43%)
Pathologists	- -

A.4.1.4 **Major cancer-related topics lectured**

Surgeons: breast cancer / head and neck cancer / gastrointestinal cancer / melanoma / urologic malignancies / multidisciplinary aspects of cancer management.

Internists: chemotherapy / cell membranes / breast cancer / multidisciplinary aspects / leukemia / gastrointestinal cancer / each of the therapeutic modalities.

Radiologists: radiotherapy / gynecologic cancer / lung cancer / early diagnosis / breast cancer / all therapeutic modalities, including chemotherapy, immunotherapy and general supportive therapy.

Gynecologists: gynecologic cancers / radiation therapy / multidisciplinary aspects of cancer management.
Pediatricians: leukemia / other childhood malignancies / multidisciplinary aspects of oncology / chemotherapy / CNS malignancies / carcinogenesis.
Pathologists: cell membranes / gastrointestinal cancer / carcinogenesis / gynecologic cancer / breast cancer.

A.4.1.5 **The use of audiovisual cancer teaching aids**

The U.S. Cancer Education Survey revealed that respondents in Departments of Obstetrics/Gynecology, including those faculty members classified as gynecologic oncologists (more than 90% of their patients had malignant diseases), tended to use audiovisual materials when teaching about cancer to a greater degree than faculty members of other departments and other subspecialties.
Data showed that a considerable percentage of cancer education faculty members expressed a desire for new cancer teaching materials in the areas of diagnosis and treatment, cellular biology and chemotherapy. In addition, a considerable percentage of respondents expressed a desire for new cancer teaching materials that consisted of slides, slide/tape programs and videotapes, as well as programmed texts.
It was recognized that the usage pattern reported reflected to some degree the availability of appropriate audiovisual materials. The findings may reflect a need for development of more and better audiovisual materials and a potential for much wider application.

A.4.1.6 **Clinical clerkships**

Respondents of *Departments of Surgery* to the Faculty and Curriculum Questionnaire included 340 faculty members from 84 different medical schools. Thirty of these (from 23 schools) met the (arbitrary) criterion for classification as Surgical Oncologist by reporting that at least 90% of their patients had malignant diseases. The observation that only 9% were surgical oncologists indicates the broad variety of individuals in such departments who teach about cancer. These include urologists / otolaryngologists / cardiothoracic surgeons / plastic and reconstructive surgeons / neurosurgeons / orthopedic surgeons / pediatric surgeons.

The clinical clerkships supervised by departments of surgery offer a crucial opportunity for the medical students to learn certain important fundamental principles concerning diagnosis and primary management of common malignancies.
Data from the Student Questionnaire indicate that on an overall nationwide basis the majority of fourth-year medical students have examined or followed patients with the most common malignancies, such as lung, breast and colorectal tumors.
However, certain relatively common malignancies which characteristically are hospitalized on surgical services appeared to lack satisfactory student exposure. The percentage of 1757 fourth-year students who reported having seen *no* patients (1978) with the following cancers is indicated, along with the new cases of each seen in the U.S.A. in 1977 are presented in Table 26 (page 182).

(In this respect a recent publication by Bakemeier and Myers (1984) is of interest.[10] They listed percentage distribution of the above mentioned 1757 clinical student respondents to the Student Questionnaire in the Cancer Education Survey (1978), according to the number of specific cancer patients seen during previous medical school experience, and the Incidence (1983) of each type of cancer in the U.S.A. These data are presented in Table 27 (page 182).)

Respondents from the *Departments of Medicine* (or Internal Medicine) to the Faculty and Curriculum Questionnaire included 312 faculty members from 92 medical schools. Seventy-five of these faculty members (from 44 schools) met the criterion for classification as Medical Oncologist, by reporting that at least 90% of their patients had malignant diseases. The observation that only 24% were medical oncologists indicated the broad variety of individuals in such departments who teach about cancer. These include hematologists / gastroenterologists / endocrinologists / immunologists / infectious disease specialists / basic scientists, in addition to medical oncologists.
Data from the Student Questionnaire suggest a relative deficiency of cancer instruction during medical clerkships, considering they are usually the longest clerkship, and it is noted that the majority of teaching in such clerkships is conducted by non-oncologists. It is also suggested that cancer teaching in departments of medicine may involve a disproportionate emphasis on leukemia and lymphoma, considering the broad spectrum of more common malignancies which internists help care for.

TABLE 26.
THE PERCENTAGE OF 1757 FOURTH-YEAR MEDICAL STUDENTS WHO REPORTED IN THE U.S. CANCER EDUCATION SURVEY TO HAVE SEEN *NO* SPECIFIC CANCER PATIENTS, ALONG WITH THE U.S. NEW CASES IN 1977.

	Percentage of students seeing *no* cancer patients	U.S. new cases per year*
Prostatic carcinoma	21%	57,000
Head and neck cancers	27%	33,100
Pancreatic carcinoma	31%	21,800
CNS neoplasms	28%	10,900
Malignant melanoma	41%	9,500

*From '1977 Cancer Facts and Figures', American Cancer Society.

TABLE 27*.
THE PERCENTAGE OF 1757 FOURTH-YEAR MEDICAL STUDENTS WHO REPORTED IN THE U.S. CANCER EDUCATION SURVEY HAVING SEEN SPECIFIC CANCER PATIENTS DURING THEIR MEDICAL SCHOOL TRAINING, ALONG WITH THE U.S. NEW CASES IN 1983.

	Percentage of students seeing patients		U.S. new cases per year**
	None	Six or more	
Lung	5%	41%	135,000
Colorectal	8%	26%	126,000
Breast	9%	33%	114,900
Prostate	21%	13%	75,000
Head and neck	27%	13%	31,100
Lymphoma	17%	14%	30,700
Pancreas	31%	4%	25,000
Leukemia	14%	25%	23,900
Ovarian	29%	8%	18,200
Malignant Melanoma	41%	3%	17,400
CNS malignancies	28%	10%	12,600

*Reprinted by permission of the authors and of Merrill T. McCord, editor of the Journal of Medical Education.
**Estimated new cases in the U.S.A., 1983 (Cancer Facts and Figures 1983, N.Y. City, American Cancer Society, 1982)

Respondents from the *Departments or Divisions of Radiation Oncology, Radiation Therapy or Radiology* to the Faculty and Curriculum Questionnaire included 129 faculty members from 69 different medical schools. Sixty-nine of these faculty members (from 55 schools) met the criterion for classification as Radiation Oncologist (as contrasted to Diagnostic Radiologist) by reporting that at least 90% of their patients had malignant diseases.
Radiation oncology faculty members are confronted with major problems in relation to obtaining curricular exposure to medical students and in overcoming student attitudes concerning the perceived generally poor prognosis of radiation oncology patients. The radiation oncology subspecialty does not have required clerkships in most medical schools.
Students were concerned about the lack in the curriculum on radiation oncology and between one-fourth and one-third of the student respondents recommended more teaching on radiation therapy.

Respondents from the *Departments of Obstetrics/Gynecology* to the Faculty and Curriculum Questionnaire included 58 obstetrician/gynecologists from 57 different medical schools. Thirty-two of these (from 31 schools) met the criterion for classification as Gynecologic Oncologist by reporting that at least 90% of their patients had malignant diseases.
Data from the Student Questionnaire suggest that gynecologic faculty members conduct active cancer education programs during the obstetric/gynecology clerkships. These clerkships are close behind surgical and medical clerkships in the amount of cancer education reported, despite the obstetric/gynecology clerkships being considerably shorter than the medical or surgical clerkships.
Thirty-four percent of the fourth-year students reported more than 10 hours of instruction in cancer topics during these clerkships.
It is noteworthy that obstetric/gynecology clerkships received the most favorable rating for the quality of cancer teaching of all clinical clerkships.

Respondents from the *Departments of Pediatrics* to the Faculty and Curriculum Questionnaire included 63 faculty members from 54 different medical schools. Thirty-three of these (from 32 medical schools) met the criterion for classification of Pediatric Hematologist/Oncologist by reporting that at least two-thirds of their patients had malignant diseases (two-thirds instead of at least 90% of patients, since heriditary and acquired non-malignant hematologic diseases constitute a significant proportion of clinical responsibility in this specialty).

Pediatric cancer education faculty members face a particularly challenging educational task related to the unpredictable exposure of students to the relatively limited number of pediatric malignancy patients in some medical school hospitals, and to the unique psychosocial problems involved with childhood malignancies.

A.4.1.7 **Faculty members recommendations concerning improvements needed and deficiencies noted in undergraduate cancer education**

- Medical and radiation oncologists appeared to be the groups most interested in establishing required oncology clerkships.
- Surgeons and gynecologists seemed more aware of improvements needed in early diagnosis and prevention than their colleagues in other specialties. On the other hand, these two groups seemed less concerned about improving teaching of multidisciplinary management than other oncologic subspecialties.
- Medical oncologists along with basic scientist faculty members seemed to be the most aware of the advantages of a required integrated tumor biology course, with pediatric, radiation and surgical oncologists also showing considerable interest in this areas.
- Radiation oncologists expressed the most concern about increasing the time available for student teaching in radiation oncology (in keeping with other observations in the Survey that this field lacks adequate exposure to medical students). Only an occasional gynecologic, medical and surgical oncologist, and no pediatric oncologists, expressed recognition of a need in this area.
- All subspecialist groups emphasized psychosocial aspects of cancer as a major area of deficiency and in need of improvement.
- Very few faculty members in any of the groups identified epidemiology or cancer patient rehabilitation as a major need in cancer education.

A.4.2 SUMMARY OF ACTIVITIES AND ATTITUDES OF CANCER EDUCATION FACULTY MEMBERS

The profile of cancer teaching, research, and patient care activities of faculty members engaged in cancer education programs, and their attitudes toward needed changes in their respective schools' Cancer Education Programs are summarized in the following statements.

1 – Significant amounts of basic science teaching, as well as basic science research, were performed by clinical department members. This finding was interpreted as indicating a considerable degree of interdisciplinary activity by these faculty members. The important role of pathology faculty members in providing an interface between basic science and clinical cancer activities was corroborated by the essentially equal distribution of the efforts of this faculty group in basic science and clinical teaching and research.

2 – Approximately one-half of the cancer education faculty members expected their time commitment to cancer teaching and research would increase over the next few years.
About one-quarter to one-third expected their cancer patient care activities to increase.

3 – Examination of categories of cancer lecture topics reported by faculty members in relation to their departmental affiliation indicated that the presentation of major topics conformed (in general) to traditional departmental teaching responsibilities in medical schools. However, these data also documented the multidisciplinary teaching of clinical topics such as
- breast cancer – 5 departments
- gastrointestinal cancer – at least 8 departments
- carcinogenesis – at least 7 departments
- tumor cell membranes – 6 departments

From these data it is apparent that a wide variety of clinical faculty members lecture on basic science cancer-related topics. As a result, the need for a coordinating mechanism such as a multidisciplinary Cancer Education Committee for planning cancer education activities, becomes critical in order to reduce excessive duplication of efforts and poor utilization of limited curricular time.
Omissions of important topics were suggested by the absence of a topic related to nutritional aspects of cancer from those mentioned, and by the paucity of responses listing epidemiology / cancer patient rehabilitation / melanoma.

4 – Teaching about cancer treatment modalities to medical students appeared to be highly multidisciplinary in nature judging from the departmental affiliations of faculty members reporting participation in such teaching.
Basic scientists reported participating in teaching about each

therapeutic area.

Faculty members from each clinical department reported teaching about treatment modalities traditionally associated with each of the other clinical departments as well as their own. This reflects both the potential multidisciplinary strength for cancer education programs and the need for coordination to avoid unproductive redundancy.

5 - Cancer education faculty members reported utilizing a wide range of audiovisual aids in their cancer teaching, although a minority from each departmental group indicated such usage. This may reflect a need for development of more and better audiovisual materials and a potential for much wider application.

Very few respondents reported using computers for instructional purposes, suggesting that the computer may be underused by cancer education faculty members for medical student cancer teaching programs.

6 - New cancer instructional materials desired by faculty respondents were primarily in the areas of diagnosis and treament, and cellular biology. Interests in such materials centered on programmed texts, slide tape sets, videotapes, and tumor simulations.

7 - Seventy-five percent of cancer education faculty members felt that a cancer curriculum should be required for all medical students. More than 90% of clinical oncology subspecialists agreed with that opinion.

About 50% of faculty respondents felt that cancer was given too little emphasis in their school. Radiation oncologist faculty members expressed this opinion most strongly, a finding consistent with other observations in the U.S. Cancer Education Survey, which appeared to reflect a relative deficiency of exposure of medical students to radiation oncology in most schools.

A majority of each group of faculty respondents indicated that they expected the amount of cancer education provided to medical students at their own institution would increase by about 15-25%. Such increases should enable medical student cancer education programs to occupy a more visible position in medical school curriculum. However, with the pressing demands of a broad variety of disciplines for medical curricular

time, such increases in cancer education should be carefully planned and executed by multidisciplinary faculty groups to assure their optimal effectiveness.

8 - The topical areas of the medical student cancer curriculum in which the largest proportion of cancer education faculty members favored increasing the amount of instruction time were:
- multidisciplinary cancer management
- clinical cancer electives
- psychosocial aspects of cancer
- diagnostic procedures.

9 - Cancer education faculty members expressed the opinion that the budget of cancer education programs for practicing physicians should be increased. Such an increased emphasis on continuing cancer education would yield indirect benefits to medical student cancer education because of the important role played by non-oncologic physicians and surgeons in medical education.

10 - Cancer education faculty members identified the following problem areas in medical student cancer education:
a - the quality of cancer-related teaching
b - early diagnosis and prevention
c - a need for more teaching time
d - psychosocial aspects of cancer
e - multidisciplinary cancer management
f - a required course in tumor biology.

In general, basic scientists, pathologists, and clinicians ranked these problem areas similarly.

The various clinical subspecialties differed somewhat in their emphasis on specific needs and deficiencies, as might be expected.

Early diagnosis and prevention was particularly emphasized among the surgical and gynecologic respondents.

Medical and radiation oncologists appeared to have the greatest interest in establishing required oncology clerkships.

Many radiation oncologists expressed the need for improvement in medical student education in their field, corroborating the observations made elsewhere in the U.S. Cancer Education Survey on inadequate exposure of medical students to the important and understaffed area of radiation oncology.

A.4.3 GENERAL OBSERVATIONS ABOUT CANCER EDUCATION FACULTY MEMBERS

A.4.3.1 'Cancer Identity' and 'Critical Mass'

Two important interrelated concepts pertaining to cancer education faculty members which evolved from observations during the Institutional Visits, were those of a 'Cancer Identity' and a 'Critical Mass' of cancer-related faculty members.

All schools visited during the Cancer Education Survey which appeared to put significant emphasis on cancer education had some key individual or faculty group which might be said to provide a 'Cancer Identity' at the institution. As used here, the term 'Cancer Identity' is defined as sufficient cancer research, patient care, and educational activity at an institution to provide a visible image or focal point to attract student interest.

Data from the Student Questionnaire revealed that only 9% of the student respondents were aware of the existence of a Cancer Education Committee at their institution (Educational Resources Questionnaire; 84% of the participating schools had a Cancer Education Committee), and only 12-15% of the students indicated that a Cancer Education Program Director or Coordinator was present at their school (Educational Resources Questionnaire: 68% of the schools had a Cancer Education Coordinator).

At institutions with a 'Cancer Identity' the faculty member or group had generally attained a recognized level of expertise in cancer research and/or patient care which enhanced their ability to stimulate heightened student interest in cancer-related subjects.

It was noted that some institutions with international reputations as cancer research centers, lacked a 'Cancer Identity' from the medical students' viewpoint. It was observed that the outstanding individuals on the faculty of those centers had little or no impact on medical student education. The reason for this was sometimes a lack of interest by these faculty members in predoctoral student teaching. More often, however, the individual interests and efforts of the faculty members had simply not been coordinated into an educationally-oriented program which carried weight in curricular decision-making and which made these outstanding faculty members accessible to student cancer education activities.

The coordination of an effective student cancer education program often rested with an individual faculty member who could relate both to oncologists and to non-oncologists on the faculty, and who could aggregate a 'Cri-

tical Mass' of participants necessary for the success of the Cancer Education Program.
A Cancer Education Program Director often represented the nucleus of the 'Critical Mass', whose size varied considerably. Schools which lacked sufficient oncologists in one or more key departments exhibited definite educational problems. Faculty members who were spending most of their time performing the crucial service and research functions of their departments often could not find adequate time to fulfill satisfactorily student teaching functions (which appeared to have a lower priority).
It was observed that the economy of most medical schools and their clinical faculty support were based primarily on revenues from patient care and research grants than on student tuition fees or education grants. Therefore, the priorities regulating the distribution of an oncology faculty member's time were generally found to be dictated primarily by research and patient care functions and *not* by the needs of the cancer education program. Consequently, categorical education funding, such as that provided by a National Cancer Institute Cancer Education Grant (which includes some faculty salary support) was consistently observed during the Institutional Visits to be an important catalytic factor in the establishment of a 'Critical Mass' of faculty members who could devote sufficient time to create a 'Cancer Identity'.

The active participation of a variety of faculty members was found necessary for the effective development and implementation of a core curriculum in cancer with well-defined educational objectives. One or more oncology-related faculty members from each department usually constituted the membership of a Cancer Education Committee. Through this Committee, faculty members could coordinate the cancer-related educational objectives of their department with those of other departments, avoiding duplication which could be wasteful of valuable faculty member and student time.

A.4.3.2 **Faculty members in schools with active cancer education programs**

In schools with active cancer research and treatment programs, oncologists were usually present in several departments, providing a potential for multidisciplinary cancer teaching.
The size of the cancer education program was not necessarily directly proportional to the number of oncologists, however, cancer research and service needs siphoned off faculty members' availability from educational

efforts. In many schools, the mere presence of oncologists on the faculty was not sufficient to ensure their contribution to cancer education.
Medical oncology units were often observed to serve as centers of coordination for student cancer education in many of those schools with such units.

A.4.3.3 **Faculty members in schools with underdeveloped cancer education programs**

In contrast to the situation in schools with active cancer education programs, limitations of faculty size and variety presented specific problems to the cancer education program in smaller schools. For example, basic science departments which were relatively small were unable to contribute much faculty time to multidisciplinary teaching, and typically had no one primarily involved in cancer-related research.
The absence of basic science representation on the Cancer Education Committee restricted the access of clinical cancer faculty members to the first- and second-year students. Consequently, interest in and understanding of neoplastic diseases by students were delayed and probably irreparably restricted in students at such schools.
Deficiencies which occurred in topics such as carcinogenesis, membrane phenomena, tumor immunology, tumor virology, or epidemiology, were sometimes compensated by a tumor pathobiology section of the pathology course, by active participation in basic science courses by qualified clinical faculty members, and/or by an integrated oncology course at the end of the second year.
The Cancer Education Program Director and the Cancer Education Committee were seen to initiate and facilitate this interdisciplinary cooperation in several institutions.
The level of cancer interest among the pathology faculty members was particularly crucial to the success of cancer education in smaller schools lacking well developed basis science research and clinical programs in cancer.
Students interviewed during Institutional Visits most often identified the pathology faculty members as those who introduced them to cancer.

A.4.3.4 **Residents and fellows and undergraduate cancer education**

Residents were consistently reported to be effective teachers of clinical subjects. Such physicians tend to resemble student 'peers' most closely.

In institutions visited where residents rotated through cancer services, they subsequently served as a means of disseminating the expertise and attitudes of the oncology unit throughout the institution.

In contrast, where residents did not rotate through cancer units, they tended to be less well prepared to involve cancer patients and their problems in student cancer teaching functions. Since residents often assign patients to the medical students during clinical clerkships, a tendency of such non-oncologically informed residents to minimize cancer patients in their student teaching activities was apparent. This was particularly apparent where certain large cancer centers were loosely affiliated with medical schools rather than integrated into their educational programs. Because of the cancer centers' proximity, cancer patients were diverted away from the medical school hospitals, whose residents and medical students seemed to lack contact with optimal varieties and numbers of cancer patients. Because of this the residents and students failed to develop an optimal level of knowledge and attitudes about neoplastic diseases.

Oncology postdoctoral fellows, who usually are essentially junior faculty members, provided an important link between senior faculty members and the residents, and therefore indirectly with students. Fellows were observed to serve as effective teachers of the residents, and often established frank and unhibited exchange of information analogous to the resident/student relationship.

APPENDIX A – SECTION 5

STUDENT RECOMMENDATIONS CONCERNING CANCER EDUCATION

A.5.1 CHARACTER OF THE STUDENT SAMPLE

The random sample of 1861 second-year and 1757 fourth-year medical students (3618 students) responding the Student Questionnaire provided an informative profile of student opinions concerning cancer and cancer education. Students were also interviewed during Institutional Visits. Most of the students interviewed were interested in cancer and were chosen to participate in the Visit because they had participated in a cancer elective. Therefore the students were in general well informed about the opportunities available in cancer education at the institution.
A broad variety of viewpoints were expressed during the interviews, making generalizations somewhat difficult. However, certain recurring themes emerged.

A.5.2 BASIC SCIENCE CANCER EDUCATION

While it was recognized that the primary goal of basic science medical education is to teach principles of *normal* structure and function (except pathology), the Student Questionnaire sought to identify sites in the preclinical curricula at which information about cancer-related topics was included.
Pathology was the course in which most cancer education was reported by students, pharmacology was the second most highly rated course, microbiology the third rated course, and biochemistry received lowest rating.
Many students were somewhat dissatisfied with the instruction on cancer topics which they received in several of the required preclinical courses, particularly biochemistry and microbiology. The U.S. data did not permit an explanation as to why this dissatisfaction existed, and the purpose was only to note the dissatisfaction, because it may be an important factor in assessing the cancer education that takes place during the preclinical years.
One possible explanation for the dissatisfaction, one that has been supported in part with observations drawn from the Institutional Visits, was that student reactions to the courses may have to do with the degree to which

students perceive the course material as 'clinically relevant'. For example, it was recognized that much of the *normal* biochemistry is relevant to considerations of tumor cell metabolism, but such material would not likely have been identified by students as 'cancer-related'.
On the contrary pathology differs from the other basic science courses in being oriented toward disease states, including cancer.

Specific criticism concerning basic science cancer education, however, involved student opinions that some cancer-related material was presented in a fragmented, uncoordinated manner, sometimes duplicating in two or more different departmental courses without apparent awareness by one department of what material the other department(s) had presented. Even when presented by one department, the pathology department, in a systems approach to cancer, the material from one system (e.g. lung cancer) was often presented in an uncoordinated fashion, by a different faculty member, without relation to that material pertaining to another system (e.g. urologic cancer).

The lack of cancer research activities in some medical schools hindered the delivery of cancer teaching because there were no faculty members with firsthand knowledge of the subject.

Other specific student suggestions concerning basic science cancer education included the establishment of an interdepartmental preclinical cancer course. Such a course has the advantages of:

a – integrating cancer information which otherwise is fragmented between other courses
b – utilizing the best-qualified faculty members
c – correlating clinical material with basic science information to an appropriate degree (spontaneously recommended by over 7% of the student respondents).

A.5.3 CLINICAL CANCER EDUCATION

A.5.3.1 Student exposure to cancer topics in departmental clerkships

Departmental clerkships form the foundation of required clinical education in medical schools. Therefore, to a large extent, clinical cancer education must be incorporated into the structure of required clerkships if all students

are to be assured of receiving at least a minimal core body of cancer instruction.

Surgical clerkships appeared to result in the greatest exposure to cancer education.

The *medical clerkships* were second with regard to the number of hours of cancer education. However, considering the breadth of the field of internal medicine and the observation that medical clerkships are often the longest of all the required clerkships, this may reflect a relative deficiency of cancer instruction in medical schools.

The *obstetric/gynecology clerkships* were close behind surgical and medical clerkships in the amount of cancer education reported.

Pediatric clerkships had the least amount of cancer education reported.

There are no required *clerkships in radiation oncology*. Only 32 out of 1757 fourth-year students (1.8%) participated in radiation oncology electives. These data were consistent with other observations in the Survey which indicated that, whereas one-third of students stated they wish to have more radiation therapy education in the curriculum, 18.8% of the fourth-year students found radiation oncology the single most *unattractive* clinical specialty in an extensive list of career options (A.5.4).

A.5.3.2 **Cancer therapeutic procedures**

Between one-fourth and one-third of the student respondents recommended more teaching about radiotherapy and chemotherapy, with slightly less suggesting more surgical teaching related to cancer. Most of the teaching on therapeutic procedures appeared to be in lectures rather than through patient exposure.

Specific areas in which deficiencies appeared to need attention involved radiotherapy, with over one-fourth of the students in their final year of medical school having had no personal patient experience involving this treatment modality.

Using breast cancer therapy as a model, the Student Questionnaire revealed that up to two-thirds of the fourth-year students lacked exposure to patients undergoing hormonal therapy of chemotherapy for that common malignancy. This problem may be related to the lack of meaningful cancer outpatient experiences at most medical schools, since those therapeutic modalities are commonly administered to ambulatory patients.

There are logistical problems of exposing students to cancer outpatient management. Time constraints both on students and on faculty members in-

volved in busy outpatient facilities make such teaching difficult to arrange. However, the importance of outpatient exposure is recognized in learning the natural history of malignant diseases and in dispelling excessively pessimistic attitudes instilled by student contact with severely ill and terminal cancer inpatients.

A.5.3.3 **Multidisciplinary patient management conferences**

The coordination of therapeutic approaches to cancer in multidisciplinary patient management is also an important aspect to which students should be exposed. It was found in the Cancer Education Survey that only two-thirds of fourth-year students reported having attended multidisciplinary treatment planning conferences. The educational value of such conferences for students appeared to be only moderate at best.

The constraints of time imposed by the schedules of busy clinicians and the need to come to management decisions concerning patients make specific attention to student educational needs somewhat difficult. Thirty-four percent of the fourth-year students rated such conferences as 'very worthwhile'; 56% rated them 'somewhat worthwhile'.

The opportunity to see medical, radiation, surgical oncologists and pathologists interact, often in an informal or good-humored (or ill-humored) manner, is highly regarded by students who otherwise would relate to such faculty members only formally at a distance, if at all.

Students reacted positively to special interpretive sessions especially held for them following multidisciplinary patient management conferences. Attention should be given to modifying such treatment-planning conferences to meet student educational needs. This may be done for example by interjecting brief reviews of topics raised during the discussion of a given patient. Another modification is the appending of a student interpretive conference after the major conference, at which students can clarify their questions with one or more faculty members.

A.5.3.4 **Psychosocial aspects of cancer**

One half of all student respondents recommended increased time allotment to the teaching of psychosocial aspects of cancer. Fully one-fourth of all students suggested spontaneously in the Student Questionnaire that the management of psychosocial problems of cancer patients represented an

area needing improvement in the medical school curriculum.
Psychosocial cancer education is recognized by students as an important area because of the marked emotional, social and financial problems created by cancer.
Students are introduced to these problems early in medical school, and are continually confronted by them while helping to care for cancer patients. This area of education is difficult to program, and highly skilled faculty members are not available in every school. It is important that attention to the needs in this area should be directed to the clinical years, where discussions of the problems should be incorporated into rounds and conferences, in addition to the active preclinical programs which already exist in at least two-thirds of the schools.

A.5.3.5 **Quality of teaching**

The open-ended question was: 'Could you please tell us what you think are the three most important improvements that could be made in the undergraduate cancer education at your institution?'
Approximately one-third of the suggestions made by student respondents indicated some aspects of quality of teaching. These recommendations included improving virtually every phase of cancer teaching in the medical schools curriculum.
The difficulty of assessing 'quality' or even 'effectiveness' of teaching has been recognized. One approach to monitoring the quality of the cancer education programs is the appointment of a Cancer Education Program Director and an active Cancer Education Committee. This mechanism can facilitate both the coordination of this multi-faceted area of medical education and the monitoring of the program for effectiveness.
During Institutional Visits it was observed however, that such Committees at many schools met infrequently and apparently served at some schools merely to meet a requirement for applying for an NCI Cancer Education Grant.
Approximately 1% of the fourth-year students spontaneously suggested appointing a Cancer Education Coordinator. Over 7% suggested increasing interdepartmental coordination. This suggests that students perceive what many cancer educators are aware of: that education programs based primarily on *departmental* planning present problems in teaching a multidisciplinary subject such as oncology which benefits from interdepartmental coordination.

A.5.4 ONCOLOGY AS A CAREER CHOICE

A.5.4.1 **Factors influencing clinical specialty choice**

The fourth-year students who had previously been asked to indicate their most favored specialty choices, were also asked to indicate the influence of a variety of factors that might have influenced that choice.
The items most frequently selected as *major factors* were:

Experiences with patients	62%
Experiences with faculty members	43%
Medical school electives	41%
Experiences with residents/interns	36%
Expected working conditions	34%
Personal experiences with family/friends	26%
Medical school courses	25%

The items most frequently selected as *not a factor* in this choice were:

Medical school research opportunities	80%
Research opportunities after medical school	78%
Fellowships after medical school	72%
Expected long-term income	41%

A.5.4.2 **Unattractive clinical specialties**

A method of evaluating the attractiveness of oncology as an area of specialization was to focus on the degree to which students found such specialties among the most unattractive areas in which to specialize.
A substantial portion of the fourth-year students find oncology as the most unattractive area in which to work, with 43% of the students selecting one of the oncology specialties as most unattractive:

Radiation Oncology	18.8%
Pediatric Hematology/Oncology	8.8%
Gynecologic Oncology	5.6%
Medical Oncology	5.4%
Surgical Oncology	4.4%

When asked why they list oncology as the most unattractive area of specialization, the most frequently mentioned reasons included:

High mortality rate	84%
Negative experiences with patients	65%

A.5.4.3 **Comments**

The results of the U.S. Cancer Education Survey of career preferences of medical students are consistent with previous studies of this subject.
The rather substantial extent to which students responding to the Cancer Education Survey found oncology unattractive should be a source of some concern. It is recognized that aversion to devoting one's entire career to an oncologic subspecialty is not necessarily tantamount to aversion to learning about cancer to a degree appropriate for a primary care physician.
But cancer educators should be concerned about the widespread unattractiveness of cancer patient care, oncologic electives, and cancer-related clinical conferences, expressed by students during the Institutional Visits and implied by the answers to several questions in the Student Questionnaire.

A brief consideration seems worthwhile of the possible causative factors behind this situation, of the potential consequences of these negative attitudes, and of feasible corrective measures.

A.5.5 POSSIBLE FACTORS CAUSING NEGATIVE STUDENT ATTITUDES TOWARD CANCER

A.5.5.1 **Personal experiences**

Since cancer is a relatively common group of diseases, virtually every medical student would be expected to have had some personal contact with cancer through a relative or friend, prior to entering medical school. The results in the U.S. Cancer Education Survey suggest that such personal experiences were major determining factors in the clinical specialty choice of 26% of the fourth-year students.
Such perceptions of cancer, often in the context of fatal illness, may either stimulate additional interest in cancer or condition students to avoid cancer-related experiences in medical school. Since most students elect medicine as a profession because they wish to help people by treating illnesses, and since the goal of such treatment is cure in most students' view, an area of medicine dealing with a significant proportion of patients considered *incurable* has a distinct disadvantage in gaining the interest of many medical students.

A.5.5.2 **Preclinical educational experiences**

Such negative attitudes brought to medical school by the students appear to be reinforced, as expressed by students and faculty members during the Cancer Education Survey, by presentations of cancer-related topics in the preclinical sciences.

Data in the Cancer Education Survey indicate that the pathology course is the major site of cancer instruction in the preclinical curriculum. Since much of that instruction may be conducted in relation to the results of autopsies, the students' perceptions of cancer as an invariably fatal disease may be strengthened. The views of pathology faculty members toward the prognosis of cancer patients, with whom they have primarily post mortem acquaintance, may be unduly pessimistic, particularly in the light of advances in current therapy.
Other basic science faculty members called upon to participate in cancer-related teaching, such as that concerning anti-cancer drugs in Pharmacology or concerning tumor immunology in Immunology, may likewise impart as inappropriately pessimistic view of the current and future therapy of malignant diseases.
Negative attitudes had also been transmitted to students by certain faculty members, most of whom had minimal personal responsibility for cancer patient care. The aversion of some non-oncologic faculty members to involvement in cancer patient care and their nihilistic attitudes toward cancer therapy were well recognized by students.
For this reason, joint teaching exercises involving both basic scientists and clinicians may help to dispel this pessimism by pointing out the recently improved prognosis of several neoplastic diseases.

A.5.5.3 **Clinical educational experiences**

Since all students are required to participate in fundamental departmental clinical clerkships, their introduction to cancer clinical diagnosis and management is likely to occur during such a clerkship, or any of several departmental services. Such an introductory experience is likely to be under the supervision of non-oncologic faculty members who themselves may have certain inappropriate attitudes or actual misinformation about current cancer diagnosis and management.
Residents also play a major role in clerkship teaching, and those who have

graduated from medical schools without strong cancer education programs may have similar deficiencies in their attitudes and knowledge.
Most academic hospitals have relatively few oncologists compared to non-oncologists sharing the clerkship teaching responsibilities. Therefore only a small proportion of students at most will have supervision by oncology faculty members, who might impart to future primary care physicians the fundamentals of modern multidisciplinary cancer diagnosis and treament, including an appreciation of the psychosocial problems of cancer patients. They might also serve as role models for future oncologists.

Another factor probably contributing to the negative outlook of many clinical students toward cancer patients is the predominance of hospitalized patients in their educational experiences, coupled with relatively little exposure to cancer outpatients. The latter are more likely than the hospitalized patients to be responding to treatment, to be less symptomatic, and to have longer survival. Although cancer outpatient clinics are frequently available for oncology elective student participation, as evidenced from the Educational Resources Questionnaire, the majority of students do not take such electives. Therefore, students derive their cancer patient experiences mainly from hospitalized patients, who often are very ill and may be terminal. This exposure tends to reinforce the close association of cancer with death and dying which had developed prior to medical school and may have already been reinforced during preclinical courses. Students may even not see sufficient numbers of cancer inpatients because faculty members or residents may consider such patients unsuitable for clinical teaching.
The lack of cancer outpatient experiences may be a factor in the poor exposure of students to certain important therapeutic procedures such as hormone therapy for breast carcinoma. Such therapy is frequently used in the management of patients with relatively indolent metastatic breast cancer, which patients are commonly well enough to be treated as outpatients.

A.5.5.4 **Potential consequences of negative student attitudes**

Two major potential consequences of negative student attitudes toward involvement with cancer patients and toward participation in cancer education activities are the following, both of which could have important implications to the delivery of optimal health care:

1 - *Primary care physicians who had not participated actively in cancer education programs in medical schools may never reach their potential skills and interest in diagnosing cancer or in obtaining optimal multidisciplinary oncologic management for their patients through appropriate referral. Furthermore, negative attitudes toward involvement with cancer patients, can surreptitiously persist and be incorporated into habits of practicing physicians. The avoidance or abandonment of advanced cancer patients, often subconsciously, may result.*
2 - *A decreased recruitment of highly qualified young physicians into certain oncologic subspecialties may result from desinterest or aversion of medical students toward those disciplines.*

A.5.5.5 **Feasible corrective measures for negative student attitudes**

The lack of awareness of student respondents to the Student Questionnaire of the presence of a Cancer Education Coordinator at their school (84% of medical schools had such a position and only 15% of students were aware of such an individual), suggests that role had not been developed fully in many schools in coordinating and improving cancer education programs.
Students recommended an increase in interdepartmental coordination and improvement of quality of teaching of cancer from basic sciences through clinical instruction.

A.5.6 SUMMARY OF STUDENT OPINIONS

- The oncology-oriented students who were interviewed generally were satisfied with their special cancer education experiences. They felt that many of their classmates had very little exposure to cancer information, especially in the clinical years.

- Negative attitudes of certain faculty members and residents toward cancer patient care had been a deterrent to the involvement of many students in available cancer education activities.

- Students expressed concern over the large number of advanced and terminal patients with whom they came into contact on the wards of their teaching hospitals. On the other hand, they generally had little or no contact with

cancer outpatients who were doing well and enjoying prolonged survival.

- Topics recommended by students for more emphasis were:
  - multidisciplinary treatment management
  - diagnostic procedures
  - psychosocial aspects
  - radiation therapy
  - cancer chemotherapy
  - work-ups on cancer patients
  - clinical cancer electives
  - cancer in basic sciences.

APPENDIX A – SECTION 6

FUNDING OF UNDERGRADUATE CANCER EDUCATION

A.6.1 FUNDING OF CANCER EDUCATION

A.6.1.1 **Introduction**

The establishment and development of any teaching program within a medical school is facilitated by the availability of financial support which is clearly designated for education. Both patient care and research programs are demanding in terms of faculty members time commitments; and student medical education programs can become third or even a byproduct on the priority scale if other activities supersede them through imposition of financial obligations.

A major source of financial support for medical student cancer education programs in the United States during the past three decades has been the National Cancer Institute. Other funding sources have included the American Cancer Society, local cancer organizations, and private donors, in addition to the basic support provided through medical school budgets.

A.6.1.2 **National Cancer Institute Funding – direct effects**

Direct effects of NCI Cancer Education Grants were found in the U.S. Cancer Education Survey to be apparent in the form of salary support for the Cancer Education Program Director or Coordinator and those associated with him/her, such as education evaluators and secretaries. These individuals usually provide the impetus for innovative cancer education activities, particularly of a coordinated, integrated multidisciplinary nature such as seminars, lecture series and special electives which require interdepartmental coordination. They also provide the communication system necessary both to inform the students and faculty members of educational activities and to obtain feedback useful in providing the programs. Without such key individuals who are afforded financial support which allows them to devote time to educational activities, many of these opportunities would fall 'through the cracks' between departmental programs and be lost.

Other direct effects of Grant support on undergraduate cancer education were stipends for post-residency fellows and for student fellowships.
A particularly important direct effect of Grant support on cancer education, especially at a new or small medical school with a small cancer faculty, was the importing of visiting speakers and teachers. Outstanding clinicians and researchers from other institutions can inject both a sense of excitement into a cancer education program, and new insights into patient care and research programs.

A.6.1.3 **National Cancer Institute Funding – indirect effects**

NCI Cancer Education Grants provided indirect stimulation for medical student cancer education, as well as for various levels of professionals, paraprofessionals, and the public.
In several institutions visited, the important decisions to appoint a Cancer Education Program Director or Coordinator and to form a Cancer Education Committee had been associated with an NCI Grant application; and even though a Grant had not subsequently been funded, the Director and Committee had continued to function. The stimulus of assessing the existing cancer education activities and of organizing a cancer education program which could be presented in a Grant application had led to clearly defined cancer educational objectives for the first time in the history of several institutions. Of major far-reaching consequences was the stimulation by the Grant application process of expanded interdepartmental discussions about cancer education. These meetings of diverse disciplines on the 'neutral ground' of education were observed to have led to improved interdisciplinary cooperation and collaboration not only in cancer education activities, but in patient care and research as well.

A.6.1.4 **American Cancer Society Funding**

Among the varied programs of education supported by the American Cancer Society, there are several which have particularly bearing on the funding of medical student cancer education. These include:

1 - ACS Professorships of Clinical Oncology.
2 - ACS Junior Faculty Clinical Fellowships.
3 - ACS Regular Clinical Fellowships.
4 - ACS Student Fellowships.

APPENDIX A – SECTION 7

CONCLUSIONS AND RECOMMENDATIONS CONCERNING STUDENT CANCER EDUCATION – U.S. CANCER EDUCATION SURVEY

Although in this abstract from the U.S. Cancer Education Survey not every topic from this Survey has been covered, this chapter will be concluded with a complete synopsis of Conclusions and Recommendations from the U.S. Cancer Education Survey.

A.7.1 ROLE OF THE PROFESSIONAL SCHOOLS

- Student cancer education programs should involve *every* medical, osteopathic and dental student.
- Student cancer education programs should be integrated and coordinated.
- Objectives of a Schools' student cancer education program should be clearly defined.
- Student cancer education programs should be continually evaluated.
- Specific problem areas in student cancer education programs should receive special attention.
- The quality of student cancer teaching activities should be continually improved.
- School administrations should strenghten the system of incentives and rewards for excellence in student teaching, including cancer education.

A.7.2 ROLE OF THE NATIONAL CANCER INSTITUTE AND OTHER ORGANIZATIONS

- The Clinical Cancer Education Program should be continued and expanded.

- Objectives for student cancer education programs should be clearly defined through National Cancer Institute support.*

- Evaluation mechanisms for student cancer education programs should be developed, through NCI support, for use both by the National Cancer Institute and by individual schools for self-assessment.**

*This recommendation has been fulfilled in a later NCI/AACE contract.[9]
**This recommendation is in progress.

APPENDIX B

THE DUTCH QUESTIONNAIRES PERTAINING TO THE CHAPTERS 2 AND 4

APPENDIX B – SECTION 1

THE DUTCH E.R.Q.-INTERVIEW QUESTIONNAIRE

1 - Heeft uw faculteit een afzonderlijke bestuurlijke structuur met betrekking tot kankergeneeskunde, zoals een aparte afdeling, subafdeling of een kankercentrum? ja / neen

2 - Heeft uw faculteit:
- a - Een commissie voor kankeronderwijs? ja / neen
- b - Een afdeling voor kankeronderwijs? ja / neen
- c - Een apart budget voor kankeronderwijs? ja / neen
- d - Een coördinator voor kankeronderwijs? ja / neen
- e - Een vertegenwoordiger voor kankeronderwijs in de Curriculum Commissie? ja / neen

3 - Worden in uw faculteit gestructureerd (in het college-rooster) aparte colleges oncologie gegeven? ja / neen
Indien ja, in welke van de volgende vakken?
Haematologie / Interne geneeskunde / Chirurgie / Radiotherapie / Radiodiagnostiek / Pathologie / Longziekten / K.N.O. / Gynaecologie / Kindergeneeskunde / Urologie / Dermatologie / Neurologie / Neurochirurgie / Epidemiologie / Huisartsgeneeskunde / Sociale geneeskunde

4 - Worden in uw faculteit multidisciplinair gecoördineerde *colleges* oncologie voor studenten georganiseerd? ja / neen
Indien ja, in welk curriculumjaar? 1 2 3 4 5 6

5 - Worden in uw faculteit multidisciplinair gecoördineerde *seminars* oncologie voor studenten georganiseerd? ja / neen
Indien ja, in welk curriculumjaar? 1 2 3 4 5 5

6 - Heeft uw faculteit tenminste elke twee weken interdisciplinaire bijeenkomsten voor behandelingsplanning van kankerpatiënten? ja / neen
Indien ja:
- a - Welke disciplines zijn hierbij betrokken?
  Haematologie / Interne geneeskunde / Chirurgie / Radiotherapie / Radiodiagnostiek / Pathologie / Longziekten / K.N.O. / Gynaecologie / Kindergeneeskunde / Urologie /

Dermatologie / Neurologie / Neurochirurgie

b - Zijn *preklinische* studenten aanwezig? ja / neen
Zo ja:
Is participatie verplicht? ja / neen
Wordt een nabespreking voor de studenten gehouden? ja / neen

c - Zijn co-assistenten aanwezig? ja / neen
Zo ja:
Is participatie verplicht? ja / neen
Wordt een nabespreking voor co-assistenten gehouden? ja / neen

7 - Worden door uw faculteit activiteiten georganiseerd in het kader van P.A.O.G. met betrekking tot de kankergeneeskunde? ja / neen

8 - Wordt door uw *faculteit* kankeronderwijs gegeven aan verpleegkundigen en paramedisch personeel?

Verpleegkundigen	ja / neen
Radiotherapie laboranten	ja / neen
Radiologie laboranten	ja / neen
Fysiotherapeuten	ja / neen
Diëtisten	ja / neen
Maatschappelijk werkers	ja / neen
Psychologen	ja / neen
Districtsverpleegkundigen	ja / neen
Anderen	ja / neen

9 - Wordt door het *Academisch Ziekenhuis* van uw faculteit kankeronderwijs gegeven aan verpleegkundigen en paramedisch personeel?

Verpleegkundigen	ja / neen
Radiotherapie laboranten	ja / neen
Radiologie laboranten	ja / neen
Fysiotherapeuten	ja / neen
Diëtisten	ja / neen
Maatschappelijk werkers	ja / neen
Psychologen	ja / neen
Districtsverpleegkundigen	ja / neen
Anderen	ja / neen

10 - Bestaan er plannen binnen uw faculteit om het curriculum zodanig te veranderen dat er meer ruimte vrijkomt voor het kankeronderwijs? ja / neen

Indien ja, welke plannen worden overwogen en wanneer zullen zij worden uitgevoerd?

	Uitvoering			
	datum bepaald		datum onbepaald	
Welke veranderingen worden overwogen?	binnen 1 jaar	binnen 2 jaar	besluit genomen	besluit nog niet genomen
A				
B				
C				

APPENDIX B – SECTION 2

THE DUTCH FACULTY AND CURRICULUM QUESTIONNAIRE

1 – Zijn er in uw collegerooster aparte colleges t.b.v. het kanker-onderwijs? ja / neen
Indien ja:
a – Hoeveel college-uren per jaar?
_____ uur
b – Welk percentage van uw colleges besteedt u aan kanker-onderwijs?
_____ %

2 – a – Hoeveel kankerpatienten ziet u gemiddeld per week?
_____ patienten klinisch
_____ patienten poliklinisch
b – Welk percentage van uw patiënten zijn kankerpatiënten?
± _____ %

3 – Denkt u in de komende vijf jaren meer, minder, of dezelfde tijd te besteden aan: *Omcirkel uw antwoord*

zorg voor kankerpatienten	kankeronderwijs
meer	meer
minder	minder
zelfde	zelfde

4 – Wilt u aangeven over welke oncologische onderwerpen door u college is gegeven in het cursusjaar 1982/1983.
Wilt u voor ieder onderwerp ook de andere vragen beantwoorden.
Onderwerp. _____
(op formulier ruimte voor 24 onderwerpen)
Aantal college-uren over zelfde onderwerp.
Curriculumjaar van dit onderwijs.
Gemiddeld percentage studenten dat het college bezocht.

5 – Wordt gestructureerd oncologisch onderwijs aan uw co-assistenten gegeven? (Hier wordt dus geen zogenoemde 'bed-side teaching bedoeld'.) ja / neen
Indien ja, wilt u dan voor ieder onderwerp ook de andere vragen beantwoorden?

Onderwerp. _____
(op formulier ruimte voor 7 onderwerpen)
Aantal co-assistenten per cursus.
Aantal malen van de cursus per jaar.
Hoeveel weken duurt het co-schap?
Gemiddeld aantal uren per co-schap gewijd aan oncologie.

6 - Wat zal volgens u de faculteit in de komende jaren doen m.b.t. kankeronderwijs voor medische studenten?
Omcirkel de letter voor het antwoord
a - Een toename van uren beschikbaar voor kankeronderwijs.
b - De beschikbare tijd wordt gelijk gehouden zoals het nu is.
c - Een vermindering van uren beschikbaar voor kankeronderwijs.

7 - Geef voor elk van de onderstaande statements aan in welke mate u het er mee eens dan wel oneens bent.
- 'In het curriculum van mijn faculteit wordt te weinig aandacht gegeven aan kankeronderwijs.'
- 'Kankeronderwijs dient door algemene universitaire afdelingen te worden gegeven, en niet door speciale oncologie afdelingen.'
- 'Kankeronderwijs zou een verplicht onderdeel in de klinische fase van het medisch curriculum moeten zijn.'

(keuzemogelijkheden op formulier:
zeer juist / juist / niet mee eens / absoluut mee oneens / niet zeker)

8 - Gebruikt u bij het *kankeronderwijs* audiovisuele hulpmiddelen? ja / neen
Indien neen, waarom niet?
Indien ja, welke van de onderstaande audiovisuele hulpmiddelen gebruikt u bij het kankeronderwijs en hoe vaak?

	vaak	soms
a - dia's		
b - band/dia series		
c - videobanden		
d - films		
e - gesloten TV circuit		

9 - Beschikt uw faculteit over een mediatheek?
ja / neen / weet niet

10 - Zijn er op uw eigen afdeling faciliteiten waar studenten voor zelfstudie audiovisuele hulpmiddelen kunnen gebruiken?
ja / neen

Indien neen, waarom niet?
Indien ja, welke hardware is aanwezig?
a - Afspeelapparatuur voor band/dia series.
b - Afspeelapparatuur voor videobanden.
Omcirkel uw antwoord

11 - Heeft u audiovisuele oncologische onderwijsprogramma's in uw bezit? ja / neen
Indien ja, hoe zijn deze verkregen? *Omcirkel uw antwoord*
a - Gekregen.
b - Op eigen initiatief aangeschaft.
c - Op aanbeveling aangeschaft.
d - Via vertegenwoordiger van farmaceutische industrie aangeschaft / gekregen.
e - Zelf gemaakt.

12 - Bent u ooit betrokken geweest bij het ontwerpen van een audiovisueel onderwijsprogramma over kankergeneeskunde?
ja / neen

Indien ja:
a - Was dit voor gebruik binnen de eigen kliniek? ja / neen
b - Zijn duplicaten gemaakt voor gebruik buiten uw kliniek?
ja / neen

13 - Bent u in het algemeen tevreden over de medische inhoud en de technische kwaliteit van beschikbare audiovisuele onderwijsprogramma's die betrekking hebben op kankergeneeskunde? ja / neen
Op welke producties baseert u uw antwoord?
Programma _____ Uitgegeven door _____
(op formulier 5 mogelijkheden voor antwoorden)

14 - Welke verbeteringen zoudt u willen zien in de audiovisuele programma's die u bij het kankeronderwijs ter beschikking staan?

Hartelijk dank voor uw medewerking!

APPENDIX C

THE DUTCH QUESTIONNAIRES PERTAINING TO CHAPTER 6

APPENDIX C

THE DUTCH QUESTIONNAIRES PERTAINING TO CHAPTER 6

Toets A 1 - De ziekte van Hodgkin is een vrijwel altijd dodelijk verlopende ziekte. juist / onjuist / weet niet

2 - De ziekte van Hodgkin is een metastatisch proces in het lymfatisch systeem. juist / onjuist / weet niet

3 - De ziekte van Hodgkin kan zich manifesteren als een zwelling in de hals *zonder* verdere klachten. juist / onjuist / weet niet

4 - De ziekte van Hodgkin manifesteert zich vooral bij patienten jonger dan 15 jaar. juist / onjuist / weet niet

5 - Bij gelocaliseerde vormen van de ziekte van Hodgkin is electieve bestraling een essentieel onderdeel van de radiotherapeutische behandeling. juist / onjuist / weet niet

6 - Bij een gelocaliseerd Hodgkin-proces komt vooral combinatie chemotherapie in aanmerking. juist / onjuist / weet niet

7 - In de Ann Arbor classificatie betekent stadium II dat lymfkierstations aan beide zijden van het diafragma zijn aangedaan. juist / onjuist / weet niet

8 - Een halskliermetastase waarvan de primaire tumor nog niet bekend is, blijkt in meer dan de helft van de gevallen afkomstig te zijn van een tumor in de naso-, oro- of hypofarynx. juist / onjuist / weet niet

9 - Een 52-jarige man komt op het spreekuur met een kleine, onpijnlijke, vaste zwelling in de hals, gelocaliseerd onder de linker kaakhoek. De eerste gedachten gaan uit naar een: congenitale afwijking / ontsteking / benigne nieuwvorming / maligne nieuwvorming / weet niet

Toets B 1 - Het 5-jaars overlevingspercentage voor de ziekte van Hodgkin is hoger dan 60%. juist / onjuist / weet niet

2 - De ziekte van Hodgkin is een primair maligne aandoening van het lymfatisch systeem. juist / onjuist / weet niet

3 - Een patient met de ziekte van Hodgkin zal zich gewoonlijk de eerste maal op het spreekuur presenteren met een onpijnlijke zwelling in de hals. juist / onjuist / weet niet

4 - De diagnose 'Ziekte van Hodgkin' is op het klinische beeld te stellen. juist / onjuist / weet niet

5 - Bestraling van aangrenzende klinisch normale lymfklierstations verbetert de overlevingskansen van patienten lijdende aan de ziekte van Hodgkin. juist / onjuist / weet niet

6 - Combinatie chemotherapie komt in aanmerking bij gegeneraliseerde vormen van de ziekte van Hodgkin.
juist / onjuist / weet niet

7 - De Ann Arbor classificatie plaatst een patient met een Hodgkin-proces in één lymfkliergebied en met algemene verschijnselen als koorts, nachtzweet en/of gewichtsverlies in stadium I-B. juist / onjuist / weet niet

8 - Een supraclaviculaire lymfkliermetastase links kan afkomstig zijn van een testistumor. juist / onjuist / weet niet

9 - Op het spreekuur komt een meisje van 10 jaar met een weke, pijnlijke zwelling in de hals. De eerste gedachten gaan uit naar een:
congenitale afwijking / ontsteking / benigne nieuwvorming / maligne nieuwvorming / weet niet

10 - Electieve behandeling bij de ziekte van Hodgkin is bestraling van aangrenzende klinisch normale lymfklierstations.
juist / onjuist / weet niet

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